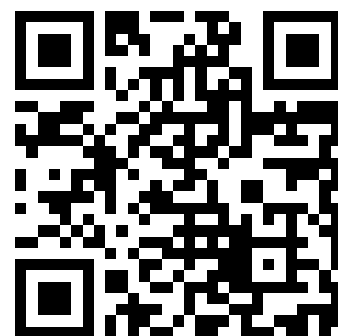

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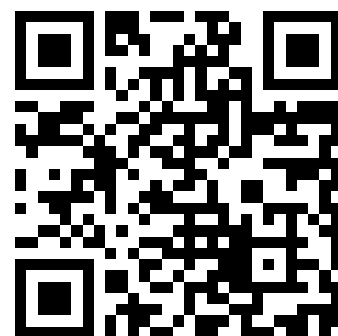
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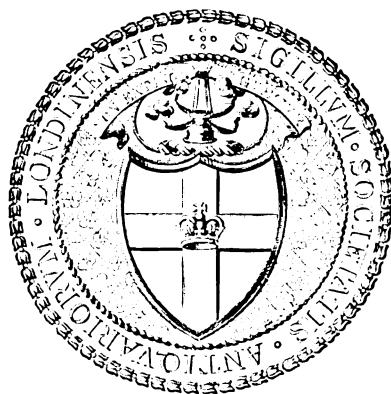
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Robert Stockton Hyne.

42

ARCHAEOLOGIA
OR
MISCELLANEOUS TRACTS
RELATING TO
ANTIQUITY

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OR
MISCELLANEOUS TRACTS
RELATING TO
ANTIQUITY

PUBLISHED BY THE
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TABLE OF CONTENTS

	PAGE
I.— <i>Recent Discoveries of Medieval Remains in London.</i> By PHILIP NORMAN, Esq., LL.D., Vice-President	1-26
II.— <i>Origin of the Neolithic Celt.</i> By REGINALD A. SMITH, Esq., F.S.A.	27-48
III.— <i>Notes on the Palaeolithic Floor near Caddington.</i> By WORTHINGTON G. SMITH, Esq., F.L.S., Local Secretary for Bedfordshire	49-74
IV.— <i>The Site, Fauna, and Industry of La Cotte de St. Brelade, Jersey.</i> By R. R. MARETT, Esq., M.A., D.Sc., Reader in Social Anthropology, Oxford, Local Secretary for the Channel Islands	75-118
V.— <i>The Feast of the Five Kings.</i> By CHARLES LETHBRIDGE KINGSFORD, Esq., M.A., F.S.A.	119-126
VI.— <i>The Hal-Tarxien Neolithic Temple, Malta.</i> By PROFESSOR T. ZAMMIT, C.M.G., M.D., Curator of the Valletta Museum	127-144
VII.— <i>On a Collection of Antiquities from the Early Iron Age Cemetery of Hallstatt,</i> <i>presented to the British Museum by LORD AVEBURY, 1916. Introduction and</i> <i>Inventory by SIR C. HERCULES READ, LL.D., F.B.A., Vice-President; Notes</i> <i>and Chronology by REGINALD A. SMITH, Esq., F.S.A.</i>	145-162
VIII.— <i>The Trousseaux of Princess Philippa, wife of Eric, King of Denmark, Norway,</i> <i>and Sweden.</i> By W. PALEY BAILDON, Esq., F.S.A.	163-188
IX.— <i>On the Dorter Range at Worcester Priory.</i> By HAROLD BRAKSPEAR, Esq., F.S.A.	189-204
INDEX	205-216

14120,

128

Vol. 67
(1715-16)

515756

20
B

LIST OF ILLUSTRATIONS

PLATE		PAGE
	Recent Discoveries of Medieval Remains in London:	
I.	Plan and elevation of the north wall of Merchant Taylors' Hall facing	1
II.	1. Merchant Taylors' Hall: foundation arch on north side. 2. Merchant Taylors' Hall: crown of arch leading to oriel . . . facing	2
III.	1. Austin Friars: foundation arch of possible chapel on south side of church. 2. Austin Friars: cloister arch. 3. West end of vaulted chamber, Gracechurch Street . . . facing	6
	Fig. 1. Austin Friars: plan and south elevation of church . . .	8
IV.	Plan of vaulted chamber and surroundings, Gracechurch Street facing	12
	Fig. 2. Plan showing recent discoveries at Blackfriars . . .	13
V.	Westminster Belfry: plan showing position of foundations discovered in 1911-12 . . . facing	14
	Fig. 3. Westminster Belfry: piles under raft . . .	17
VI.	Plan of medieval Conduit Head with later additions, in garden of no. 20 Queen Square . . . facing	18
VII.	Sections of medieval Conduit Head with later additions, in garden of no. 20 Queen square . . . facing	18
	Fig. 4. Plan showing position of Conduit Chamber in rear of no. 20 Queen Square . . .	18
VIII.	1. Queen Square: entrance to staircase leading down to reservoir. 2. Queen Square: an arch leading down to reservoir . facing	18
	Fig. 5. No. 20 Queen Square, from the garden . . .	20
IX.	1. Queen Square: staircase from reservoir. 2. Queen Square: foot of staircase after removal of upper steps . . . facing	20
X.	1. Queen Square: interior of reservoir after removal of vaulting. 2. Queen Square: openings in east wall of reservoir . facing	22

LIST OF ILLUSTRATIONS

PLATE		PAGE
XI.	1. Queen Square: passage down to reservoir from NW. and sill of window. 2. Wall of passage to reservoir from E. and remains of chimney facing	24
XII.	1. Queen Square: brick passage, looking towards entrance. 2. Queen Square: brick passage, showing hole in floor leading to brick chamber facing	26
Origin of the Neolithic Celt:		
	Figs. 1 and 2. Side-scrapers, Le Moustier, Dordogne	30
	Fig. 3. Flint 'point', facettèd, Le Moustier	30
	Fig. 4. Hand-axe, front and side views, Ickleford, Herts.	31
	Fig. 5. Side-scraper, front and back views, Ickleford	31
	Figs. 6 and 7. Ovate hand-axes, front and side views, Ickleford	32
	Fig. 8. Ovate implement, front and side views, Ickleford	32
	Fig. 9. 'Point', Le Moustier	33
	Fig. 10. Hand-axe, front and back views, Le Moustier	33
	Fig. 11. Hand-axe, with lateral butt and section, Thames at Tilbury	34
	Fig. 12. Front, side, and back views of implement from Grime's Graves, Norfolk	35
	Fig. 13. Implement with lateral butt (drawn separately), Yiewsley, Middlesex	37
	Fig. 14. Implement from Copton-in-Preston, Kent	37
	Fig. 15. Front and end views of implement with one flat face, Taplow, Bucks.	38
	Fig. 16. Front and end views of implement with one flat face, Grime's Graves	38
	Fig. 17. Front and side views of heavy 'celt', Grime's Graves	39
	Fig. 18. Faces of thin 'celt', Grime's Graves	39
	Fig. 19. Characteristic 'celt', Grime's Graves	40
	Fig. 20. Flake-implement, Weeting, Norfolk	40
	Fig. 21. 'Celt', front and side views, Santon, Norfolk	40
	Fig. 22. Faces and section of 'celt', Grime's Graves	41
	Fig. 23. 'Celt', front and section, North Cray, Kent	42
	Fig. 24. 'Celt', front and side views, Weeting, Norfolk	43
	Fig. 25. Faces of broad-butted 'celt', Grime's Graves	43
	Fig. 26. Hand-axe, front and side views, Warren Hill, Suffolk	46
	Fig. 27. Hand-axe, front and side views, Southampton	47

LIST OF ILLUSTRATIONS

xi

PLATE

PAGE

Notes on the Palaeolithic Floor near Caddington :

Fig. 1. Plan of Gaddesden Row, Herts., showing Butterfield's brick-yard	50
Fig. 2. Butterfield's pit, Gaddesden Row	51
Fig. 3. Section of the Gade and Ver valleys, showing Gaddesden Row and Caddington Hall	51
Figs. 4-6. Sections showing palaeolithic deposits at Gaddesden Row	54
Fig. 7. Front and side views of quartzite implement found 30 ft. deep at Caddington	55
Figs. 8 and 9. Side views, fronts, and sections of implements, Gaddesden Row	58
Fig. 10. Side and front views of implement, Gaddesden Row	59
Fig. 11. Front and side views of implement from contorted drift, Gaddesden Row	59
Fig. 12. Front and side views of twisted implement, Gaddesden Row	59
Fig. 13. Discoidal implement, side and front views, Gaddesden Row .	59
Fig. 14. Discoidal implement, front and side views, Gaddesden Row	59
Fig. 15. Implement with conical face, front and side views, Gaddesden Row	60
Fig. 16. Square-ended implement, front, back, and side views, Gaddesden Row	60
Fig. 17. Discoidal implement, side and front views, Gaddesden Row .	60
Fig. 18. Front and side views of chopper, Gaddesden Row	60
Fig. 19. Front and side views of worked flake, Gaddesden Row	60
Fig. 20. Worked flake, front and side views, Gaddesden Row	60
Fig. 21. Front, back, and side views of worked flake with double patina, Gaddesden Row	61
Fig. 22. End-scraper on blade, front and side views, Gaddesden Row	61
Fig. 23. Flake with hinge fracture, side and front views, Gaddesden Row	61
Fig. 24. Three flakes refitted, Gaddesden Row	61
Fig. 25. Quartzite scraper, front and side views, and section, Gaddesden Row	61
Fig. 26. Plan and section of Round Green, near Luton, Beds.	63
Fig. 27. Section showing the Lea valley between Caddington and Round Green	64
Fig. 28. Section through pond and palaeolithic floor at Round Green	65
Fig. 29. Twisted ovate implement, front and side views, Round Green	71

Notes on the Palaeolithic Floor near Caddington (*continued*):

Fig. 30. Implement in pieces rejoined, front and side views, Round Green	71
Fig. 31. Ovate implement, front and side views, Round Green	71
Fig. 32. Pointed ovate implement, side and front views, Round Green	71
Fig. 33. Side and front views of implement, Round Green	71
Fig. 34. Sharply pointed implement, side and front views with reverse of point, Round Green	72
Fig. 35. Implement made from crusted nodule, side and front views, Round Green	72
Fig. 36. Implement with incurved sides, front and side views, Round Green	73
Fig. 37. Front, back, and side views of implement broken by the finder, Round Green	72
Fig. 38. Side-scraper, front and side views, with section, Round Green	73
Fig. 39. Thick flake used as side-scraper, front and side views, with section, Round Green	73
Fig. 40. Three flakes refitted, incomplete fracture on the right, Round Green	73
Fig. 41. Front and side views of ochreous implement from contorted drift, Round Green	74

The Site, Fauna, and Industry of La Cotte de St. Brelade, Jersey:

XIII. 1. Cave-interior, 13 April, 1914. 2. Eastern wall, a fortnight later facing	75
Fig. 1. Ground-plan of cave, showing progress of excavation	76
Fig. 2. Vertical section of cave along line 10 ft. from eastern wall	76
Fig. 3. Interior of cave after the collapse on 3rd September 1915	81
XIV. Tooth of <i>Elephas ?trogontherii</i> : 1. General view. 2. View showing wear-surfaces facing	86
Fig. 4. Fragment of bone showing striations	87
Fig. 5. Bone awls (?)	87
Fig. 6. Tortoise-core	92
Figs. 7-18. Specimens of implements of first quality. Figs. 7, 11, 14, 16. Ovate flake-implements. Figs. 8-10, 12, 13, 15. Pointed flake-implements. Fig. 17. Flake-implement with square end. Fig. 18. Knife	93

LIST OF ILLUSTRATIONS

xiii

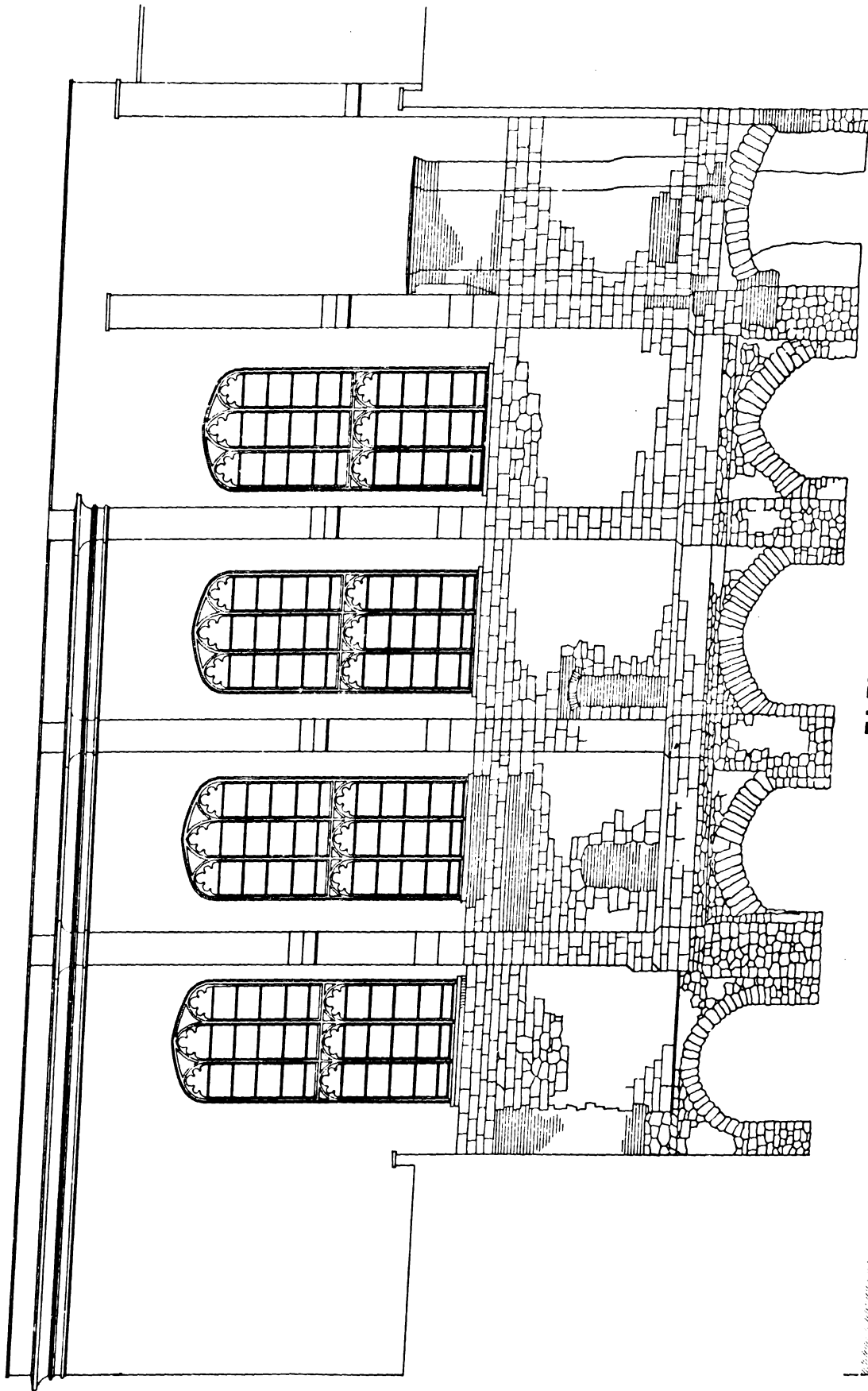
PLATE		PAGE
	The Site, Fauna, and Industry of La Cotte de St. Brelade, Jersey (<i>continued</i>) :	
	Fig. 19. <i>Coup de poing</i> from bottom of bed	95
	Figs. 20-33. Specimens of implements of second quality. Figs. 20, 21. Small pointed flake-implements. Fig. 22. Disc: both faces worked flat. Fig. 23. Core: used as plane? Fig. 24. Hollowed flake. Fig. 25. Curved flake. Fig. 26. 'Square' flake. Fig. 27. Long flake, with one side trimmed. Fig. 28. Dwarf implement: sharpened. Figs. 29-31. Dwarf implements: long. Figs. 32, 33. Dwarf implements: square	99
	Fig. 34. Discoid core	103
	Fig. 35. Flake-implement of first quality, with chip replaced	105
	Fig. 36. Beach pebble used as core	107
	Fig. 37. Synthetic section of implementiferous bed	113
	Figs. 38-47. Five implements (figs. 38-42) from upper, and five (figs. 43-47) from lower, bed; each set occurring together within one cubic foot. Figs. 38, 39, 41. Pointed flake-implements. Fig. 40. Long flake, serving as end-scraper. Fig. 42. Ovate flake-implement. Figs. 43, 44. Hollowed flakes. Figs. 45-7. Rough flakes, used	115
	Fig. 48. 'Point' found with <i>Elephas ? trogontherii</i>	117
	The Hal-Tarxien Neolithic Temple, Malta :	
	Fig. 1. Plan of the excavated portion of the Hal-Tarxien temple in September 1915	131
	Fig. 2. Niche and altar stone	132
XV.	1. Flint implements found under the altar of niche Q'. 2. Room T, showing on right fragment of a colossal stone statue. 3. Western side of room T	between 144 and 145
XVI.	1. Blocks ornamented with spirals in room T. 2. Relief of animals in room V. Clay birds, beads, etc., from necklaces	between 144 and 145
XVII.	1. Beads, birds, etc., from necklaces. 2. Bone cylinders made from the legs of birds, and bone awl handles	between 144 and 145
XVIII.	1, 2. Clay objects of doubtful use	between 144 and 145
XIX.	1. Clay statuettes, Bronze Age period. 2. Bronze Age decorated pottery	between 144 and 145
XX.	1. Bronze Age pottery. 2. Bronze Age vases. 3. Bronze Age pottery. 4. Bronze Age beakers and other pottery	between 144 and 145
XXI.	1. Bronze Age pottery. 2. Bronze or copper daggers and celts. 3, 4. Stone blocks with spiral ornament	between 144 and 145

PLATE		PAGE
	The Hal-Tarxien Neolithic Temple, Malta (<i>continued</i>):	
XXII.	1. Stone block with spiral ornament. 2. Slabs above the ornamented altars in room T. 3. Stone block, with spiral ornament, below Bronze Age layer	between 144 and 145
XXIII.	1. Bronze Age layer with pottery. 2. Relief of bulls and a sow in room M	between 144 and 145
XXIV.	1. Model of a neolithic building. 2. Symbolical objects. 3. Conical stones probably used as objects of veneration	between 144 and 145
XXV.	1. Neolithic bone borers and burnishers. 2. Neolithic amphorae	between 144 and 145
XXVI.	1. Neolithic amphorae <i>in situ</i> . 2. Neolithic bowl. 3, 4. Neolithic jars	between 144 and 145
	Collection of Antiquities from the Early Iron Age Cemetery of Hallstatt :	
XXVII.	Embossed bronze bucket, the handles missing	facing 145
	Fig. 1. Handle and chape (two views) of dagger	147
	Fig. 2. Iron dagger, with top view of pommel	147
	Fig. 3. Portions of iron sword, with restoration	147
	Fig. 4. Part of iron sword, with gold-foil in position	147
	Fig. 5. Diagram of gold-foil on iron sword	147
	Fig. 6. Gold-foil, perhaps from sword pommel	149
	Fig. 7. Sword pommel of ivory, side and top view	149
	Fig. 8. Iron spear-head, with pin in socket	149
	Fig. 9. Iron celt, with lateral projections	149
	Fig. 10. Socketed celt of iron, with top view	149
XXVIII.	Objects of bronze and an iron clasp	facing 151
XXIX.	Bronze armlets and bracelets	facing 153
	Fig. 11. Bronze anklet, one of a set	153
XXX.	Brooches of 'spectacle' type and embossed plate	facing 155
	Fig. 12. Bronze brooch, side and top views	155
	Fig. 13. Brooch without spiral spring, side and top views	155
	Fig. 14. Bronze bow brooch, foot wanting	155
	Fig. 15. 'Kettle-drum' brooch, front and side views	155
	Fig. 16. Brooch of Certosa type, pin missing	155
	Fig. 17. Bow of 'cushion' brooch, top and side views	155
	Fig. 18. Bronze pin, with point protector	155
	Fig. 19. Baluster head of pin	155
XXXI.	Beads of amber, glass, bronze, and shell	facing 157

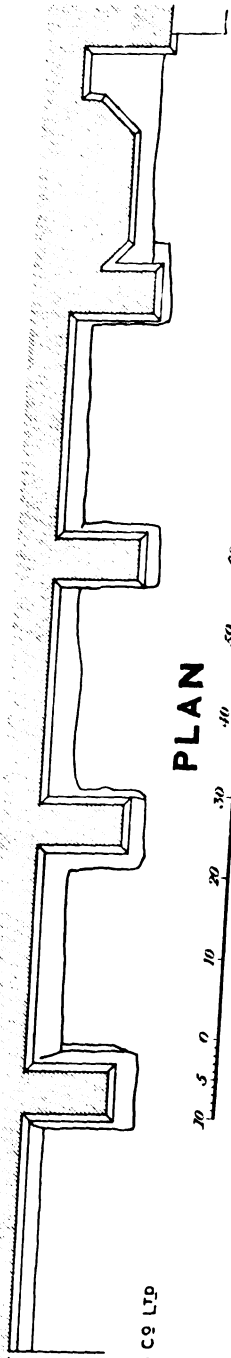
LIST OF ILLUSTRATIONS

XV

PLATE		PAGE
	The Dorter Range at Worcester Priory :	
XXXII.	1. Portion of reredorter from south. 2. North-east corner of dorter subvault facing	189
XXXIII.	1. Original dorter entrance from cloister. 2. Later dorter entrance facing	193
XXXIV.	1. Windows of reredorter subvault. 2. Springing of vaulting, reredorter subvault facing	195
XXXV.	1. East end of Song School. 2. West wall of dorter in reredorter subvault facing	197
XXXVI.	1. Section of dorter, looking east. 2. Section of reredorter, looking east facing	199
XXXVII.	1. Section of dorter and reredorter, looking south. 2. South side of reredorter and section of dorter, looking north . . . facing	201
XXXVIII.	Plan of dorter, infirmary, etc. facing	203



ELEVATION



PLAN

Scale of Feet



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PLAN AND ELEVATION OF THE NORTH WALL OF
MERCHANT TAYLORS' HALL.
Published by the Society of Antiquaries of London, 1916.

I.—*Recent Discoveries of Medieval Remains in London.* By
PHILIP NORMAN, Esq., LL.D., Vice-President.

Read 9th December 1915.

(I) MERCHANT TAYLORS' HALL, THREADNEEDLE STREET.

IN September 1910 I heard that houses had been pulled down on the north side of Merchant Taylors' Hall, and that various interesting discoveries had been made. Mr. Reader and I went there together, and an elevation and plan drawn by him of Roman remains then found are given in *Archaeologia*, vol. lxxiii. They record the position of a Roman floor near the hall resting on gravel about 17 ft. 6 in. below the present ground level.

More apparent, however, to those who visited the site were the foundations and the masonry up to the windows of the hall of the Merchant Taylors, which had been hidden for generations. At a glance one saw that these foundations and the lower part of the wall were ancient.¹ It will be seen that the foundations of the buttresses, and to a large extent the arches between them, are of chalk, the crowns of the arches being of harder material (pl. II, fig. 1). These arches project slightly in front of the wall, which had a plinth about 2 ft. above the medieval ground level, and was faced with coursed stones. Mr. Mew thought that they were mostly from Godstone or Gatton. The two arches containing little or no chalk appeared to be later. In all likelihood the foundations, with the lower part of this wall, except where it had been repaired, belonged to the original structure. Further examination has proved that most of the wall above is also medieval, but it has lost its facing stones, which have been replaced by stucco. In the course of the excavation the chalk footings of a medieval wall were found, 2 ft. wide, running parallel with the hall, 20 ft. to the north of it.

In 1913, not long after the north side of the hall had been laid bare and again hidden by houses for an indefinite period, more light was thrown on the

¹ I am indebted to Mr. Ernest Woolley, a past Master of the Merchant Taylors' Company, for admirable photographs of various parts of the buildings, and the authorities of the Guild have furnished a most accurate drawing of the north side by their surveyor Mr. Mew (pl. I), also other photographs.

building by the discovery of the upper part of an arch in the south wall near the west end in a position corresponding with that of the arched recess, or 'buffet', in the north wall. This was clearly an arch connecting the hall with a fine oriel, or more correctly bay, window; the line of the slanting roof can still be seen on the building which runs at right angles from the west end of the south wall. An illustration from a photograph shows the appearance of this arch before restoration (pl. II, fig. 2); it appears to belong to the fourteenth century. One sees traces of a floor below, dating from the time when rooms were built against the closed arch, and there were fragments of plaster on the wall. The surveyor has also made a drawing of the south side of the hall at the time of this photograph. The wall was shortly afterwards cased with Portland stone, the outer moulding of the arch being alone left exposed to view. It appears from the Guild's accounts that not later than the sixteenth century the oriel window was removed or incorporated in a house containing a staircase, with a room or rooms over it.

Whatever the building may have been that stood on the site of the bay window from the sixteenth century onwards, it was cleared away after the Great Fire, by which time the origin of the arch had doubtless been forgotten. The upper part of this interesting relic remained as a window to the hall until about the year 1795, when it was finally blocked up. Great alterations were also made then to the other windows in the hall. These windows, which had previously been smaller, with clearstory windows above, were then heightened, and the clearstory windows filled in.

A few paragraphs from the documentary evidence about this banqueting hall and the ancient buildings still attached to it will I hope be acceptable. When the late Mr. C. M. Clode wrote his *Memorials of the Merchant Taylors' Company*, published in 1875, he knew that the hall was not *entirely* destroyed in the Great Fire. But it was thought to belong in the main to the late seventeenth century, until, in 1893, the beautiful recess, already referred to, was discovered in the north wall, near the west end, which proved that the ancient features still existing were at any rate important. Recently Mr. H. L. Hopkinson, Master of the Guild in 1910-11, following in the footsteps of Mr. Clode, but with greater opportunities for studying old documents, has thrown much light on various properties situated in no fewer than four parishes between Cornhill and Threadneedle Street, which the Merchant Taylors by degrees acquired and now occupy; and on the age respectively of their three ancient buildings—the hall, the crypt, and the kitchen. From information supplied by him, the following quotations and references to documentary evidence and my accompanying remarks are derived:

In his privately printed volume entitled *The History of the site of Merchant*



Fig. 1. Merchant Taylors' Hall: Foundation arch on north side

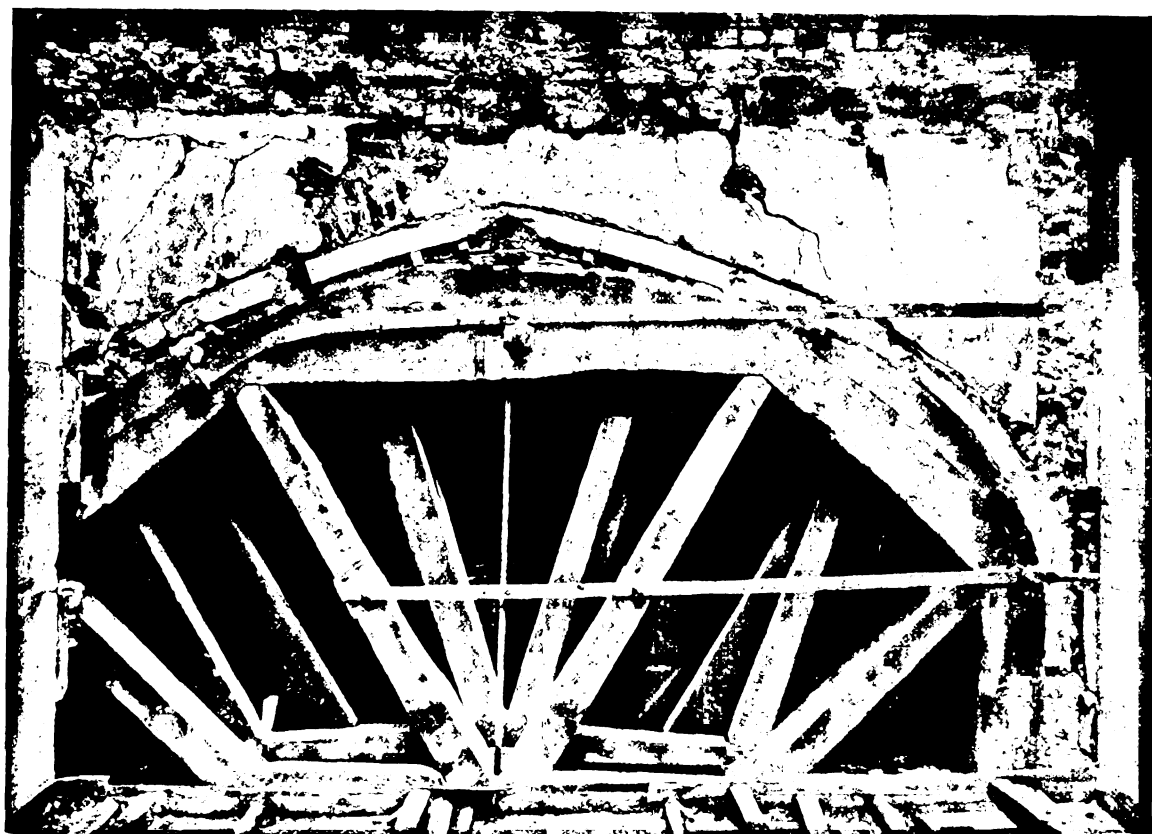


Fig. 2. Merchant Taylors' Hall: Crown of arch leading to oriel

Taylors' Hall, pp. 9-12, Mr. Hopkinson refers to a deed of feoffment dated 8th May 1332, by which Edmund Crepin conveyed to John de Yakeslee, Tentmaker to the King, all his principal mansion in the wards of Cornhill and 'Bradestrete', with the great gate towards Cornhill and the solar over it, and with another gate towards 'Bradestrete' belonging to the same mansion, which Sir Oliver Ingham, knight, had hitherto held of Crepin and inhabited. Ingham was a gallant soldier, who fought and died in France, and whose tomb, with effigy, is in the parish church of Ingham in Norfolk. It is clear from the evidence that 'Bradestrete' thus referred to was not the Broad Street with which we are familiar, but was what is now called Threadneedle Street.

In 1345 Yakeslee conveyed the property to John Aystwyk, 'marchant et citein', who conveyed it in 1347 to certain feoffees or trustees for the 'Guild or Fraternity of St. John the Baptist of London', as the present Merchant Taylors' Company was then called. It remained vested in trustees till the year 1392, when, the Guild having obtained a licence in mortmain, the property was conveyed under their own title.

In an old book belonging to the Company, known as the 'Memoriall or Ledger Booke', prepared by their legal adviser 'upon the perusinge of all the evidences belonging to this house', there appears the following memorandum: 'but yet is to be noted that the said Londes have belonged to the Companie of Merchaunt taillours by way of feoffmente upon truste sythens decimo nono of King E 3' (i.e. 1345). If that year be correct then it would appear that the Company's beneficial ownership of the property began with the conveyance to Aystwyk, who must therefore have purchased it as their nominee.

When the site was transferred in 1392 there were two messuages comprised in the conveyance (where formerly there had been but one), viz. a messuage called 'Taillourshalle' in the parishes of St. Benet Fink and St. Martin Outwich (the site occupied by the present hall), and another messuage in the parish of St. Peter's, Cornhill. Mr. Hopkinson's evidence seems to prove that the messuage in St. Peter's, Cornhill, was in fact the mansion formerly in the occupation of Sir Oliver Ingham which Crepin had sold to Yakeslee, and that the site of the hall was then part of the garden attached to this house. It is described in the earliest roll extant, namely that for the year 1399-1400, as 'le veill hostiell' (the old mansion), and stood south-east of the present hall, where no. 2 White Lion Court, Cornhill, now is. It may have been used for a time as the hall of the Company while the present hall was being built. Further study of the documents fails to give an exact date for that event; it must have been between the years 1345 and 1392.

A deed between John 'Chircheman' or Churchman and various members of the Fraternity of Taylors and Linen Armourers, dated 1388, shows that a

kitchen then occupied the same site as the present one, to the south-east of the hall, and it may have been the kitchen of Ingham's residence, to which perhaps there was access through a pointed archway, now blocked and partly concealed by a huge fireplace standing out from the east wall. This archway seems to be the oldest architectural feature in the building. In 1425-6 a large sum was spent on the kitchen, and nothing else of importance was done until comparatively modern times. We may conclude, therefore, that most of it dates from then. In the accounts for 1433 is the following entry:

Item spenden on mete and drinke and bot-hire when men went to see Kennington kechyn roof 18^d.

It was perhaps the royal residence at Kennington that was visited for the purpose of getting some hint as to the roof of the Merchant Taylors' kitchen. The latter, which escaped with slight damage in the Great Fire of London, was seriously injured in the fire of 1765, which destroyed houses in Bishopsgate Street, Leadenhall Street, and Cornhill. In February 1916, after the reading of this paper, but before it had gone to the printer, a shaft was sunk adjoining the north wall of the kitchen, and the original foundations of chalk and ragstone were found at a depth of 14 ft. to 15 ft. below the present ground level.

We now come to rather an important subject, that of the former existence and probable position of a chapel at Merchant Taylors' Hall. Under a grant from Simon of Sudbury, bishop of London, 1361-75, a chapel dedicated in honour of St. John the Baptist, on the north side of St. Paul's Cathedral, was appropriated to the use of the Guild, and priests were appointed to say masses there daily and to pray for the souls of brethren and sisters deceased. It was still used by the Guild in 1551, as appears from an entry in the accounts of that year 'for making clean the Chapell at Polles against Christynmas'.

The Guild also had a private chapel at their hall which almost certainly had been built before the year 1398, when the earliest accounts begin; for there is no record of its construction, though the cost of building is regularly entered in these accounts. The existence of the chapel in 1403-4 is proved without question by the following entry:

Item pur cereges et chaundell en la chapel del sale et en la chapell de Seint Poules. xxs. iiij^d. ob.

The chapel must have adjoined the hall, for the accounts of 1430-1 relate to a gutter between the two buildings:

Item for v lb. soudur to the gotter beside chappelle and the halle 2s. 6^d.

By a bull of Pope Calixtus III, dated 1455, after mention that the fraternity

had founded and endowed a chapel at 'Taillours Halle' in the parish of St. Martin Outwich, leave is given to have masses and other services performed in the said chapel, saving always the right of the parish church of St. Martin Outwich.

The boundary between the parish of St. Martin Outwich and that of St. Benet Fink runs diagonally across the hall, its west wall, except about 15 ft. to the south, being in the latter parish. This would not have left room for the chapel there, and moreover an early building called the 'King's Chamber' occupied the available space on that side.

Part of the north wall is also in the parish of St. Benet Fink. As regards the remainder of that side, between the entrance to the hall and Threadneedle Street there was a small court-yard, probably as old as the chapel, across which access was obtained by a covered gateway to the street. The rest of the frontage in Threadneedle Street was occupied by houses let to tenants, but no buildings there of any height could have touched the hall or they would have blocked the north windows.

The south side, except a narrow piece at its east end, where the old court-room stood, is occupied by the garden. At the west end of the south wall was the large oriel window already mentioned. If the chapel adjoined the hall except on the site of the old court-room, on the south side of the hall near the east end, it must have been a building not higher than the present modern corridor, or it would have interfered with the other windows.

The only available site remaining is that to the east of the hall, where there is a vaulted crypt which appears to date from the late fourteenth century. It is now of two bays, but there was formerly a third bay to the north under the entrance court, which was destroyed in 1853, when the present clerk's office was built. Allen,¹ who gives a ground plan, says that the dimensions are 39 ft. 10 in. by 12 ft. 10 in., the material being chalk and ragstone. The floor is about 12 ft. below the modern ground level. The last contemporary reference to a chapel occurs in a rent roll for the year ending Lady Day, 1546, a few months before the act for the dissolution of chantries was passed. Shortly afterwards, namely in 1555, a room called the 'Bachelors' Chamber' is thus mentioned, and like the chapel it adjoined the hall:

Item paid to the Plomer for IIII pounds of soder occupied in the mendyng of a gutter at the easte end of the hall adjoinyng to the bachelors' chamber.

¹ *Hist. Lond.*, by T. Allen (Wright's edition), vol. iii, p. 251. Allen shows the beginnings of two diagonal ribs, suggesting a fourth bay, which was perhaps a mistake of the draughtsman. No allusion is made to it in the text. He does not give the points of the compass, but in Clode's *Memorials* the plan is copied, this end being marked 'north'. The existing bays are immediately east of the hall. The third bay was more to the north.

The entries in the minute books of the Court of Assistants prove that the bachelors' chamber was over the crypt.

Mr. Hopkinson gives good reasons for suggesting that the bachelors' chamber was in fact the chapel, which after the passing of the Chantries Act fell into disuse, and in the course of years was handed to the Bachelors or Yeomen of the Guild as a convenient meeting-place.

The belief that the chapel was east of the hall is strengthened by an entry in an ancient book called the 'Treasury Account', dated October 1493, recording payment 'towards the bieldynges and Repairyng of the Hall end eastwardes, the chapell, the chapell chambre, the botery, the pantry, and other places'. The space claimed for the chapel would have left plenty of room for the passage leading to the kitchen, and for the buttery. The fact that the crypt is not oriented, but runs north and south, presents a difficulty, but domestic chapels did not always follow the rule. An exception is that of the chapel in the gate-house of Carnarvon Castle. Judging from the survey made by order of the Lord Mayor, 'reduced into one intire plat', by John Leake, and engraved by Hollar in 1667, which shows ground plans of destroyed City churches, not as rebuilt but as they were before the Great Fire, the medieval parish church of St. Edmund, king and martyr, must have run north and south as does the present one. There is an outlined copy of Leake's plan by George Vertue.

It has been objected that the site thus allotted to the Merchant Taylors' chapel was too narrow for its length, but until the year 1403 the Guild had no ground immediately to the east of it, and they would have had to adapt themselves to the conditions available. From what has preceded we must conclude that the only other possible site for the chapel is that of the old court-room built about 1681 and destroyed in our own time, but there is no record of ancient remains having been found there, and the space is thought to be inadequate.

I need do no more than barely mention the fact that the Merchant Taylors, before acquiring their property south of Threadneedle Street, had been established in Basing Lane, probably on the site of nos. 39 and 41 Cannon Street, on the south side of the court-yard of the old Red Lion Inn, now known as Red Lion Court.

It is also beyond the strict limits of our subject that in 1336 Edmund de Crepin sold to one John de Colonia property south of that which he had sold to John de Yakeslee; that this property had another principal mansion on it about where Sun Court, Cornhill, formerly Weigh House Yard, now is, and that it came into the possession of the Grocers' Company, who are still the owners.

The hall of the Merchant Taylors' Company is of quite exceptional interest because, apart from the noteworthy events that have occurred there and the number of illustrious people who have been associated with it, it is now the only



Fig. 1. Austin Friars: Foundation arch of possible chapel on south side of church

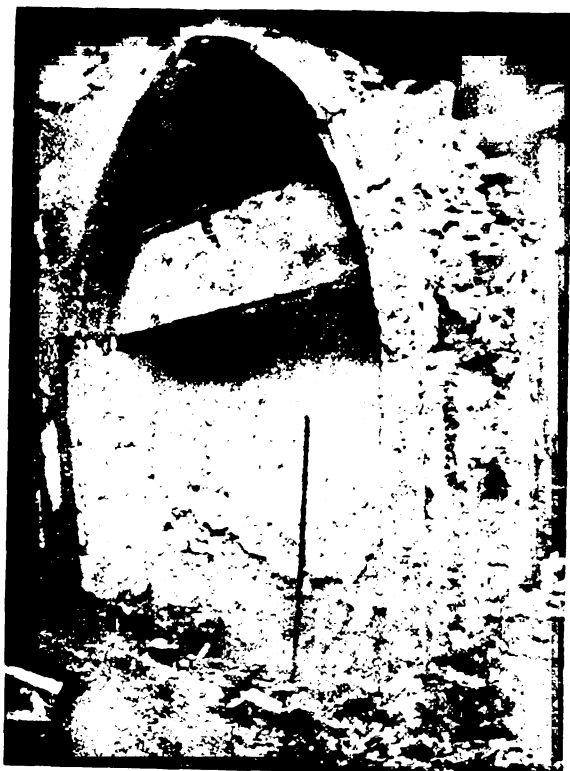


Fig. 2. Austin Friars: Cloister arch



Fig. 3. West end of vaulted chamber, Gracechurch Street

medieval hall existing in London which belongs to a City Guild, and in all probability none of the others has occupied the same site so long as the Merchant Taylors. The Goldsmiths, who have been on their site in Forster Lane since 1357, run them hard. At the Mercers' there is ancient masonry which does not, however, form part of their hall. The present hall of the Barbers' Company, formerly their court-room, now somewhat altered, was designed by Inigo Jones.

I repeat my thanks to Mr. Hopkinson and to Mr. Woolley. Thanks also are due to Mr. Edward Nash, F.S.A., for his kindly help.

(2) THE DUTCH CHURCH, AUSTIN FRIARS.

The convent of the Augustine Friars in London was founded A.D. 1253 by Humphrey de Bohun, earl of Hereford and Essex. Stow is our authority for saying that his descendant, of the same name and title, rebuilt the church in 1354, and that he was buried in the choir. Nothing now remains of it but the nave and side aisles. After a destructive fire in 1862, which burnt out the wood-work and did much further damage, the building was restored in 1863-4 at a cost of no less than £12,000, the roof being entirely modern. Much of the masonry inside is, however, original. The north, south, and west walls are composed of various materials; among them chalk is plentiful. The arcading that divides the nave and aisles survived the fire. The tracery of the windows is a copy of the previous fourteenth-century work.

On 29th June 1550 the nave of the church was granted by Edward VI 'to the Dutch nation in London, to be their preaching place'. In 1910 the authorities of this community decided to pull down various houses on the south side, to underpin the western part of the south wall of the church, which was bending over a good deal, and to replace the houses by higher structures more closely packed together. The work was begun in the autumn, my diary recording that on the 15th of November the ground had been excavated from the south-west corner to the fourth buttress.

The natural soil here, generally consisting of a thin layer of brick-earth resting on the gravel, was reached at a depth of 12 ft. 6 in. to 13 ft., the excavation being carried to a depth of 15 ft. below the modern ground level. The three western buttresses had had buildings against them; their lower parts were original. The old wall of the church extended between the first and second buttresses up to the window. The character of the masonry was as follows: Below the windows both the wall and buttresses had successive bands of ashlar and shaped flint; below these there was coursed rubble, then random rubble. At a depth varying somewhat, as will be seen from the elevation which Mr. Charles Reilly the architect was good enough to supply, the foundations of the buttresses

and the crowns of foundation arches between them were exposed to view (fig. 1). The drawing shows that the foundations were not identical in shape or character. Those of the buttresses, after the first foot or two, projected irregularly beyond them. The material was generally chalk, but the foundation of the second buttress was for the most part ragstone. The foundation arches between the buttresses were of chalk and projected about a foot in front of the rubble wall. They have strong points of resemblance to the foundation arches on the north side of Merchant Taylors' Hall, and they appear to have been of similar date,

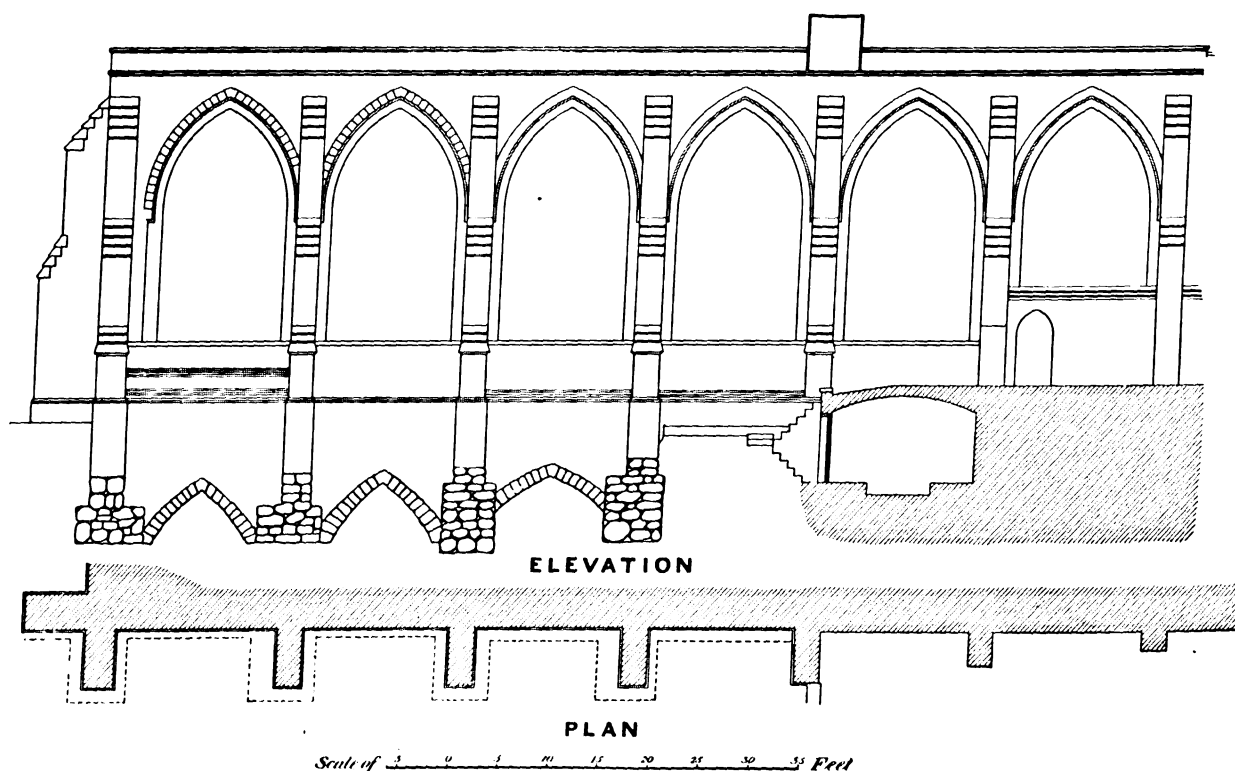


Fig. 1. Austin Friars: plan and south elevation of church.

perhaps soon after 1360, for in all probability the building of the church would have begun at the east end and would have taken some time. The drawing shows only the excavation as far as the fourth buttress. It was afterwards carried on beyond the modern heating chamber of the church and the southern entrance (the sixth buttress forming the west side of the modern porch) as far as the seventh buttress, the character of the foundations resembling those already described; but the seventh buttress, which was of Reigate stone repaired with brick, had old brick underpinning. The new buildings south of the south wall of the church are so close that lower portions of the buttresses are involved in them.

Although a considerable space was excavated on the south side of the

church, the gravel being generally reached at a depth of about 12 ft. 6 in., I did not hear of any Roman objects coming to light. Immediately south of the porch or sixth bay, and about 15 ft. from the church wall, an arch was discovered running east and west (pl. III, fig. 1), the crown of which was 3 ft. to 4 ft. below the present ground level; at the spring of the arch it was 8 ft. wide and was composed chiefly of ragstone, but had thin tiles placed in the joints. Built into it were also a few pieces of red brick. A wall connected with it was continued 10 ft. east to another arch on the same line, and I was told that there were traces of another arch running north at right angles, and that both had brick in them. They were all rough foundation arches of some building. The present south doorway of the church is modern, replacing a seventeenth-century doorway of which there is a photograph at the church. Inside, however, in the seventh bay or that immediately to the east, there is a large recessed arch with segmental head, which appears to have been rebuilt in the restoration of 1863-4. The sixth and seventh bays have only half windows, beginning at a considerable height from the ground. Thus there is evidence that a building on the south side occupied more or less the length east and west of the two bays with an entrance the position of which is indicated by the recessed arch, and it may have been a chapel.

In 1914 it was observed that inside the church the walls and pavement had become very damp, the chalk, which is plentiful in the lower part of the masonry, absorbing a large amount of moisture. An excavation was made near the south-west corner to a depth of 15 ft., for the purpose of studying the cause and to find out if possible what could be done to stop further mischief. A few pieces of medieval paving tile, pottery, and other objects were dug up, but nothing further was done, and it is thought that the walls are now rather drier. The natural flow of water in the soil is here from north to south, and the cause of damp is doubtless the carrying of the foundations of the new buildings to a considerable depth immediately south of the church, as it prevents this moisture of the soil beneath it from escaping. Thanks are due to Mr. Rus, the verger, for his help on the various occasions that the church was visited.

Among the houses destroyed in 1910 was no. 6a Austin Friars, dating from the early part of the eighteenth century, which had a fine late seventeenth-century staircase. A similar house was no. 2, where the Vannecks, of the family of Lord Huntingfield, carried on business for half a century or more, the name being still in the directory of 1843.

Our account only deals with the results of personal observation at Austin Friars, not with the general site of the conventual buildings, on which, however, of late years much light has been thrown owing to excavations on the north side of the church. This subject, however, has been well worked out by our Fellow Mr. W. A. Cater and the officials of the London County Council. Mr. Cater has

used it as a basis for two papers read by him before the Archaeological Association, and published with an accompanying ground plan. As I did not watch the excavations, though I visited the site while they were in progress, comment by me would be out of place, but attention may be drawn to one particular arch discovered at an earlier date, of which an illustration obtained under the following circumstances is here given (pl. III, fig. 2):

In the year 1895 two 'Queen Anne' houses on the north side of the church, numbered 10 and 11 Austin Friars, were pulled down, and before their destruction I drew the staircase of no. 10, with its painted ceiling and turned and twisted balusters. I took the opportunity of examining the rooms on the ground floor and found there the upper part of a pointed arch, also visible outside for a height of three or four feet, but so obscured by paint and stucco that no one would have suspected its origin. When the house was destroyed in December of that year I paid it a hurried visit and found the work of demolition proceeding rapidly. There was just time for a photograph by Mr. Coventry Dick, taken, at my request, from the inside looking south-east, after the arch had been excavated almost to its base. The house ran north and south, occupying the west side of what is sometimes called 'Austin Friars Square', though not officially recognized by that name. The arch was near the north end of the east wall of the house; it was over 13 ft. high with a span of 7 ft. 6 in.: in the view a 5 ft. rod rests against it; on its crown there appeared to be traces of a vaulting rib. The arch fits into Mr. Cater's plan, at the north-west corner of the cloister, which is represented by 'Austin Friars Square', on the north side of the church. In 1861 the Rev. Thos. Hugo in his account of Austin Friars referred perhaps to this arch, but he did not say where it was, and gave no particulars. At the time of the destruction detached pieces of masonry were found, but I did not see them, and have not been able to find out if they are still in existence.

(3) ALDGATE CRYPT, SOMETIMES CALLED THE CHAPEL OF ST. MICHAEL.

Information about a subterranean building, formerly called St. Michael's church or chapel, has hitherto been rather fragmentary. It is here pieced together with additions which are perhaps worth putting on record.

In the *Gentleman's Magazine* for April 1789 (vol. lix, p. 293) we are told that there was a chapel 'beneath the houses of Mr. Relph, the south side of Leadenhall Street'. In the same publication for 1790 (vol. lix, p. 413) a quotation is given from a manuscript by 'the late Dr. Ducarel', dated 1754, recording that it was 'under the shops of Mr. Gilpin, a chemist, at the end of Fenchurch Street and Leadenhall Street'.

Confirming this more or less, Wilkinson in his *Londina Illustrata*, 1815, says

that it 'is situated between the east end of Leadenhall Street and Fenchurch Street, under the houses facing the pump at Aldgate'. He has an illustration of the interior, and a ground plan showing that the north end was not rectangular but slanted very much, following doubtless the line of the thoroughfare. He calls it St. Michael's church, and although in his letterpress he describes the position accurately, on the plan it is placed to the north of Aldgate pump.

There is a detailed account of the building, with a small plan and view, founded evidently on Wilkinson's illustration, in Wright's edition of *Allen's History of London*, 1839, vol. iii, p. 89. We are there told that it was under the house at the south-east corner of Leadenhall Street, the entrance being by a flap in front (in place of which the artist has drawn a pointed window). He adds that the pillars were buried about 10 ft. below the cellar floor, and that the crypt was 46 ft. long. This proves that it must also have been under the adjoining house to the south, the frontage of the two being certainly not more, as shown in the drawing by T. H. Shepherd to illustrate *London in the nineteenth century*, 1829, and in Horwood's map of London, 1799, where the two houses are unnumbered.

In the early seventies of last century several houses at the east end of Fenchurch Street and Leadenhall Street having been pulled down, the two facing Aldgate were not rebuilt; thus the streets where they converge end at a more western point than they did previously. At the date of this change the crypt was to all intents and purposes destroyed, and the site ceased to have any building over it.

In December 1910 a new sewer was being made along the street called Aldgate, and I then examined a part of the excavation that was about 36 ft. east of the present east end of the two streets. The base of one of the pillars of the crypt was visible in its original position, also detached pieces of the vaulting, and of a capital like those shown in Wilkinson's illustration. The remains were of some hard stone, but, according to the *Gentleman's Magazine*, the walls had been built of squared chalk, another instance of the use of that material in the City. The workmen said that they had dug through part of an arch still standing, but this had again been covered over.

The idea that the crypt was St. Michael's church or chapel is perhaps founded on a statement in the Trinity Cartulary, misquoted and misunderstood by Stow,¹ that a certain piece of land, granted in 1314 by the Prior and Convent of Holy Trinity, or Christchurch, to John de la Marche, was near the chapel of St. Michael towards the north. There is, however, no evidence

¹ Stow's *Survey*, Kingsford's edition, vol. ii, p. 291. Stow elsewhere, translating from the Trinity Cartulary, says that 'Norman tooke upon him to be prior of Christ's Church, in the year of Christ 1108, in the parishes of Saint Marie Magdalen, S. Michael, S. Katherine, and the blessed Trinitie'.

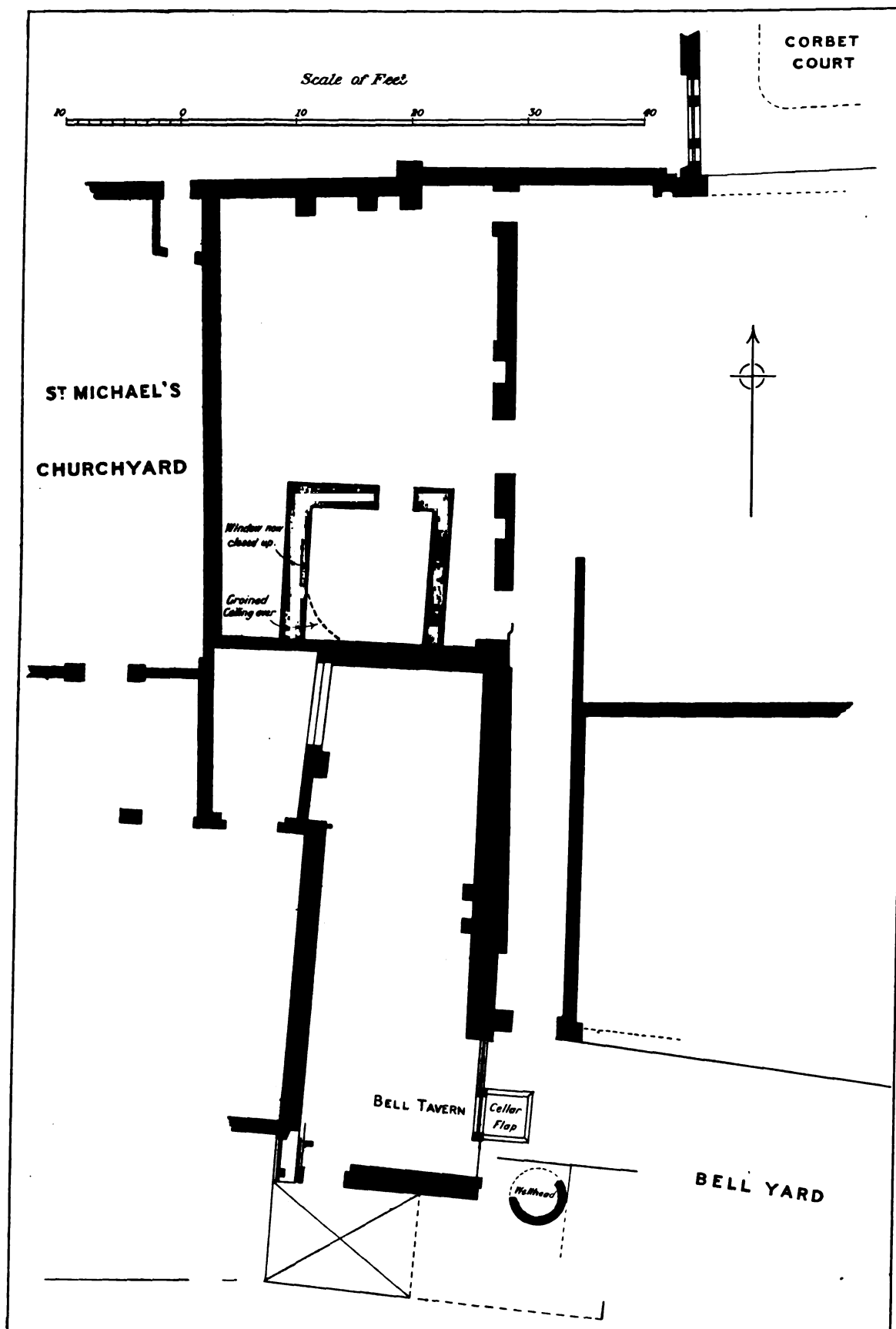
that this building was connected with our crypt, which was not oriented and had the appearance of a domestic undercroft, like that for instance of Gerard's Hall, Basing Lane, of which there are various illustrations. It is referred to by me in a paper read 17th March 1898, and printed in our *Proceedings*. The church of St. Katherine Cree, which was built in the burial-ground set apart for the lay inhabitants of Holy Trinity, is mentioned as the chapel of St. Katherine and St. Michael in a bull of Pope Innocent III, who died in the year 1216.

ALDGATE PUMP.

The crypt was near the site of Aldgate pump. Stow says, 'the principal street of this ward beginneth at Aldgate, stretching west to sometime a fair well where now a pump is placed'. In 1549 he was dwelling hard by, possibly over the crypt, when, as he relates, the bailiff of Romford was executed 'on a gibbet near to the well within Aldgate'. In 1876 the water which supplied Aldgate pump from the well was found to be impure, and the pump was then closed. It was afterwards re-erected about 16 ft. farther west, and is now supplied with New River water from a small tank beneath. It is perhaps over part of the crypt, and 16 ft. farther east is a grating in the street which is over the site of the dis-used well. This had been filled up, and was cut into during the excavation of 1910. I am indebted to Mr. R. Kemp, who has written a useful account of Aldgate Ward, and to Mr. Hartley, for help in writing these short notes on Aldgate crypt and Aldgate pump.

(4) VAULTED CHAMBER WEST OF GRACECHURCH STREET.

In August 1912 a very extensive excavation was begun between Gracechurch Street on the east, the churchyard and parsonage of St. Michael's, Cornhill, on the west, Bell Yard on the south, and Corbet Court on the north, when Roman walls were found which have been reported on elsewhere (pl. IV). By the passage into St. Michael's churchyard, called Bell Yard, in a cellar of the Bell Tavern, at a depth of 5 ft. 6 in. below the present ground level, the capital of what appeared to be a massive round column came to light, its diameter being 5 ft.; the upper part to a depth of about 5 ft. was chiselled to a smooth surface. Later examination proved that it was the head of an ancient well. Old prints show a pump near at hand in Bell Yard. Some weeks afterwards I observed the lower part of another well close to the line of Gracechurch Street. My only record of it is that the containing wall appeared to be built of chalk, and that it went down to the full extent of the excavation. According to the *City Press* a few fragments of Roman tiles were found in it, but the clerk of the works had



PLAN OF VAULTED CHAMBER AND SURROUNDINGS,
GRACECHURCH STREET.

Published by the Society of Antiquaries of London, 1916.

not seen them. To the north-east of the Bell Yard well, and near the boundary of St. Michael's churchyard, was a chamber with rubble vaulting, having a blocked window in the west wall which may have been a later insertion; there was no opportunity of seeing it from the outside. The ground plan was 11 ft. 6 in. by 10 ft. 5 in., and it was 12 ft. 6 in. high. The crown of the vault was some feet below the present ground level, but unfortunately the exact depth is not recorded.

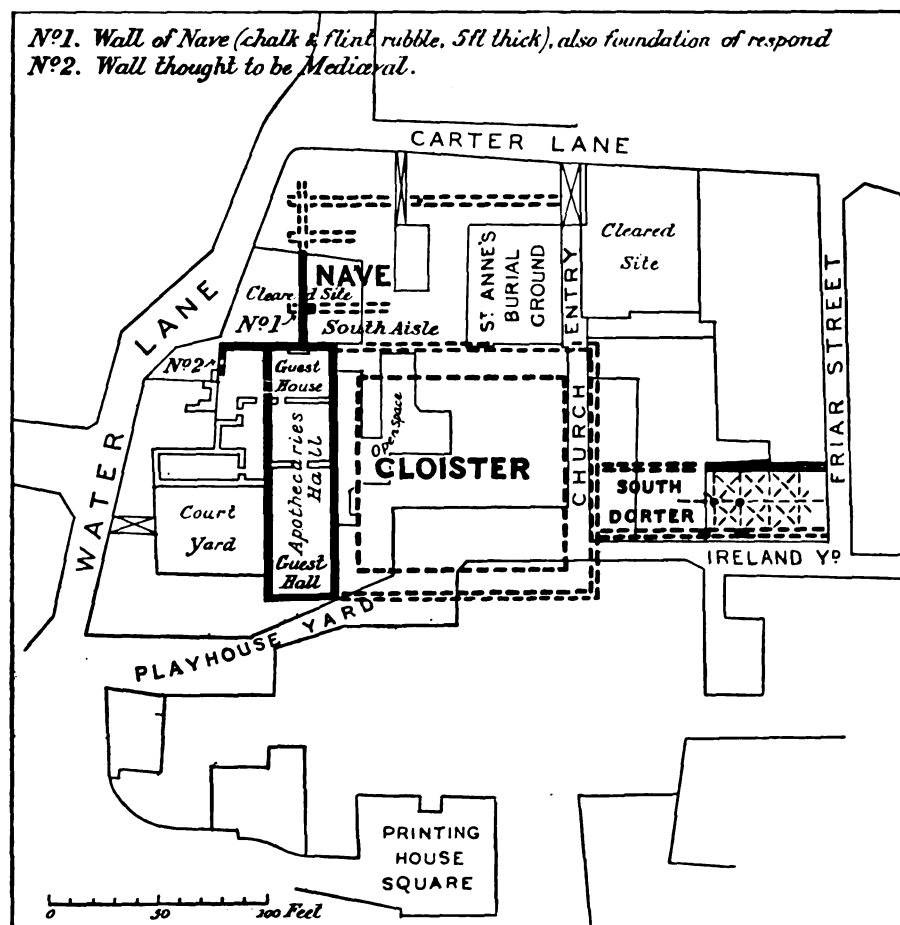


Fig. 2. Plan showing recent discoveries at Blackfriars.

The rubble walls were chiefly original. What was the date of the chamber or what purpose it served I am not prepared to say, but there can be no doubt that it was medieval (pl. III, fig. 3).

(5) EXCAVATION AT BLACKFRIARS.

In the autumn of this year (1915) there was an interesting discovery on the east side of Water Lane, Blackfriars. That part of the premises of the Apothecaries' Company which was called the mill-house, where the Society's drugs

were ground, north-east of the dispensing department, and immediately north of the hall, could no longer conveniently supply the requirements of the Company, and was pulled down. On the site being excavated the workmen came upon the remains of the west wall of the church of the Dominican Priory. An inner respond marked the line of arcading between the south aisle and the nave. Some tile pavement could be seen undisturbed. The wall, 5 ft. thick, was composed of chalk and rubble. It ran due north, from about the centre of the north wall of the building of which the present banqueting hall forms the greater portion, and which is on the site of the Guest House and the Guest Hall of the Priory. Its position on the conjectural plan of the priory precinct, which helps to illustrate Mr. Clapham's paper in *Archaeologia*, vol. lxiii, is I believe accurate almost to a foot. This is really a remarkable proof of Mr. Clapham's intuition as an interpreter of ancient buildings. Measurements of the remains discovered were made by him and Mr. Godfrey.

Another wall was found running east and west immediately west of what was the north wall of the Guest House, with a return wall running south. It stood above medieval ground level, and was of rubble, with ashlar quoins at the angle probably of Reigate stone. The stone jambs and mullion of a pointed arched window were in the wall, but it could not be determined if they were in their original position.

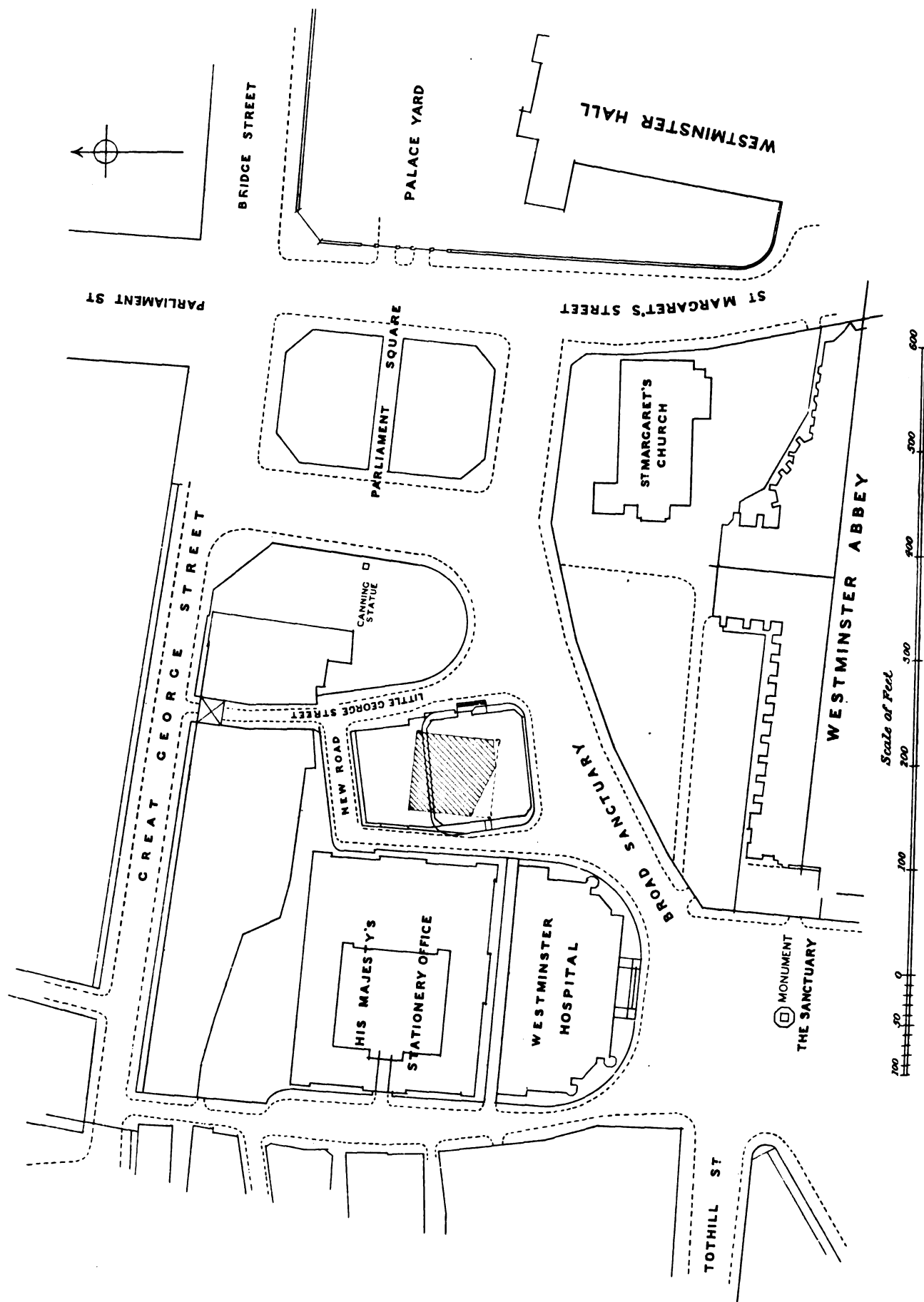
The sketch-plan here shown (fig. 2) gives the exact position of the discovery in relation to the modern streets and buildings surrounding the site. It is extended so as to include the remains of the south dorter brought to light and destroyed in the year 1900.

Perhaps it should be mentioned that in 1913, during the excavations on the site of the old General Post Office in St. Martin's-le-Grand, considerable traces of the foundations of St. Leonard's, Foster Lane, were unearthed, but they were not of sufficiently definite character to need special description. This was one of the City churches destroyed in the Great Fire and not rebuilt.

(6) WESTMINSTER BELFRY.

For centuries one of the most remarkable buildings in Westminster was the belfry at the west end of what is known as the Little Sanctuary. This massive stone tower, built in 1249-53, was not more than 60 ft. high, and was surmounted by a tall wooden spire. Mr. W. R. Lethaby has found in the Record Office documents giving information about the plumbers and carpenters who worked there.¹ It was the belfry of Westminster Abbey, but he doubts if it ever belonged to the church, thinking that, in part at least, it 'may have been built

¹ *Westminster Abbey and the King's Craftsmen*, by W. R. Lethaby, 1906, pp. 153-6.



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WESTMINSTER BELFRY: PLAN SHOWING POSITION
OF FOUNDATIONS DISCOVERED IN 1911-12.

Published by the Society of Antiquaries of London, 1916.

to represent Westminster town in some sort of competition with the London bell-house by St. Paul's'. In 1249-50 the bells were cast whilst the isolated belfry was being built. In 1252-3 it was ordered that the large new bell should be hung and rung by the eve of the Feast of St. Edward.¹

There is perhaps an illustration of this belfry in Van den Wyngaarde's view of London and Westminster (c. 1550), though it appears to be somewhat east of the site, corresponding more nearly with that of St. Margaret's church; but perhaps the draughtsman looked for pictorial effect rather than accuracy in placing his towers. The conjectural elevation of the belfry by Mr. Lethaby is largely founded on Van den Wyngaarde's drawing.

Stow (1598) speaks of the building as 'a strong Clochard of stone and timber covered with lead', having 'three great Bels since generally rung at coronations, triumphs, funerall of Princes and their obits', but confuses it with the clock-house or 'tower of stone containing a clock',² which was built for Edward III in 1365-6, and is shown in Hollar's print of New Palace Yard. It is probable that in Stow's time the wooden spire had already disappeared. Norden, writing about 1600, records that this 'ancient and strong building' was then a dwelling-house.

Strype, in his edition of Stow's *Survey* (1720),³ tries to identify the tower with the church of the Holy Innocents, mentioned in the reign of Henry III. He gives an impossible ground plan, and says that it was then 'made use of for a wine cellar belonging to the Quakers' tavern in Thieving Lane'.

The next writer on this building was Stukeley, whose paper about it is printed in the first volume of *Archaeologia*. He thought it was the ruin of an asylum connected with the Sanctuary, and described its two stories as 'two chapels one above the other'. Although Stukeley's ideas about the belfry are of no value, they are accompanied by useful plans and elevations. The former are inaccurate in measurement, but they show the massive character of the masonry, while the elevation perhaps gives a good idea of the general appearance of the building. Three of the square masses at the corner were solid, the fourth had a circular staircase in it. On the east side there was also a later external staircase. Stukeley visited the building 14th November 1750, and says that it was being destroyed at great labour and expense to make a new market-house.

In the edition of Maitland's *History of London*, published in 1756, or six years

¹ Close Rolls, 34 and 37 Henry III.

² This tower also contained the bell called 'Edward of Westminster' or 'Great Tom', which was presented by William III to St. Paul's Cathedral. The clock-tower was granted to St. Margaret's parish in 1698, and pulled down soon afterwards. Its position is shown on a plan of the precincts of Westminster Abbey in Sandford's *Coronation of James II*, 1687. It was rather less than 200 ft. north of Westminster Hall.

³ Strype's *Stow*, Book VI, p. 46.

after Stukeley's visit, we are told that it was then used as a tavern or wine vault; but perhaps the writer had merely copied what appeared in a previous edition. He describes it as 'a prodigious strong stone building of two hundred and ninety feet square, or seventy-two feet and a half the length of each side, and the walls in thickness twenty-five feet'.

Stukeley's errors with regard to the origin of the structure have been often repeated, notably by Sir Walter Besant, who in his volume *Westminster* gives an illustration and a highly imaginative account of it. He says that in this 'gloomy fortress' Elizabeth Woodville, queen of Edward IV, gave birth to her elder boy. Among others also led astray were Dean Stanley and the Rev. Mackenzie Walcott.

The Westminster market appears to have been more or less of a failure, and in 1805 the site of the belfry was covered by a sessions house built from the designs of Mr. S. P. Cockerell, father of Mr. C. R. Cockerell, R.A., and grandfather of our valued Fellow. After the passing of the Local Government Act in 1888, and the formation of the first County Council, this octagonal building was either destroyed or so enlarged and added to that externally all trace of it disappeared, the change occurring in 1892-3. But soon, notwithstanding the increased size, it became inadequate for its purpose. More land was acquired, and it was determined to erect an entirely new building. In February 1912, hearing that there had again been a clearance on the site, and that medieval remains had been discovered, I went there and had an interview with Mr. William Charles Lee, clerk of the works, who kindly showed me what was still to be seen, and soon afterwards furnished me with the accompanying plan of the site and its surroundings (pl. V), and two photographs which had been taken for the architect Mr. Gibson. From these, and from the information supplied by him, it appears that a solid stone raft or foundation of rubble masonry had come to light. This foundation was nearly square in plan, about 72 ft. by 80 ft., but part of the south face had been cut away. The upper surface of it was 9 ft. 3 in. below the bench mark on the west end of Westminster Abbey, which is 18.51 ft. above ordnance datum.¹ The soil beneath was loose gravel, 2 ft. of the top of which had been removed. This raft, however, not having been thought firm enough without some aid to support the huge weight of the belfry, it rested on a network of piles chiefly made of elm, but there was also some beech. They varied in diameter from 6 in. to 15 in., and were 9 ft. or 10 ft. long, being driven into the gravel without penetrating below it. The raft, composed of ragstone and lime mortar (not cement), was 4 ft. thick. One of the photographs, which we reproduce (fig. 3), shows a few of the old piles, after the raft that rested on them had

¹ Ordnance datum, to which all heights are referred in the Ordnance Survey, is 12½ ft. below Trinity high-water mark and 4½ ft. above Trinity low-water mark.

been destroyed. The most southern part of this raft was 250 ft. north of Westminster Abbey, with which, as appears from the plan, it was parallel.

The foundation stone of the present Westminster Guildhall, now covering the site, was laid by the Duke of Bedford, 2nd May 1912, and it was opened by his Royal Highness Prince Arthur of Connaught, 19th December 1913. The contract price of the building is said to have been £73,000.

I may, perhaps, be allowed to add that attached externally to Cockerell's Sessions House or Guildhall, and to the enlarged Guildhall of 1892, was a doorway



Fig. 3. Westminster Belfry : piles under raft.

formerly part of the old Westminster Prison, which seems also to have been a kind of poorhouse. It bore the following inscription :

Here are several sorts of Work
For the Poor of this Parish of
St. Margaret's Westminster
As also the County, according to
Law, and for such as will beg and
Live Idle in this City and Liberty
of Westminster.

Anno 1655.

The prison had ceased to be used in 1836. The doorway is now incorporated inside the present Guildhall. The lock and key of the old door are also preserved there.

(7) DEMOLITION OF CONDUIT-HEAD, QUEEN SQUARE.

The Grey Friars or Friars Minor of London, like other medieval religious bodies, took great pains with the water-supply of their convent, and a description of this is given in what is known as the Grey Friars Register,

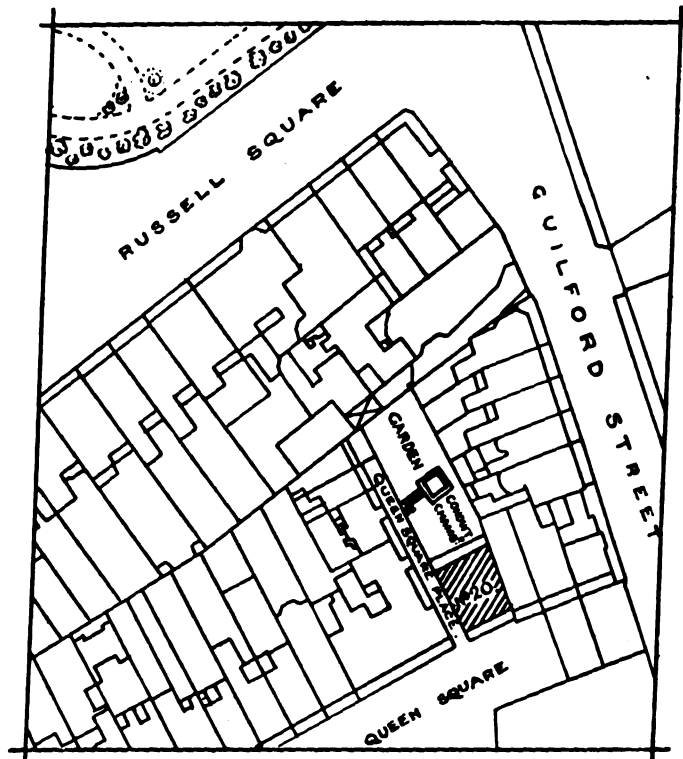
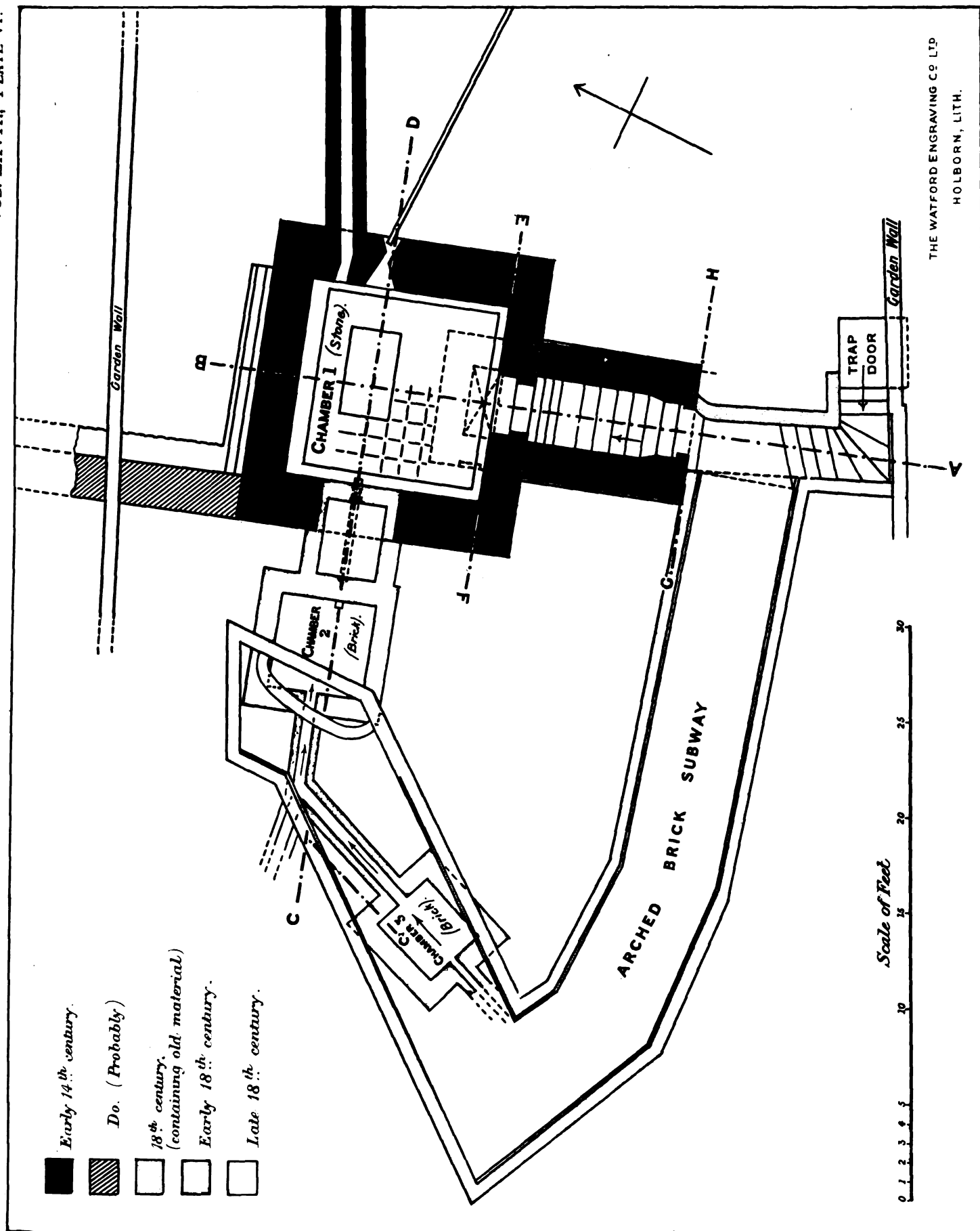


Fig. 4. Plan showing position of Conduit Chamber in rear of no. 20 Queen Square.

a manuscript now at the British Museum,¹ which contains not only materials for a history of them but memoranda relating to the Franciscans in general, put together by a friar of the house about 1526. The full text, with appendix of original documents and admirable notes by our Fellow Mr. C. L. Kingsford,² was published last year. The original water system ended at what in the seventeenth century came to be called the White Conduit, of which there are still remains under a room behind a house in Chapel Street, Lamb's Conduit Street. Established in 1255-8, before long it was found to be inadequate, and about fifty years afterwards there was an extension to a point then in the open

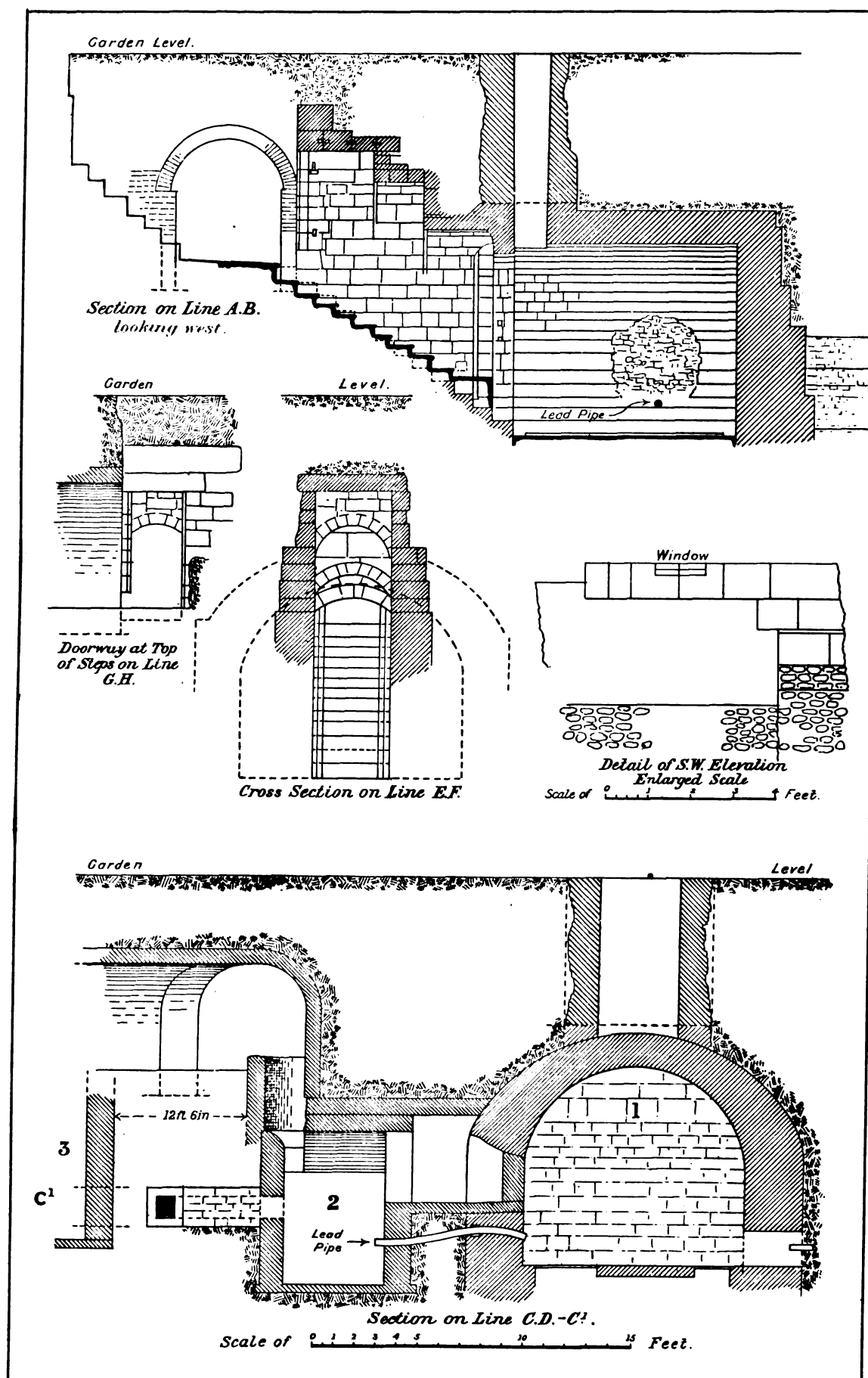
¹ Cotton, MS. Vitellius F, xii.

² *The Grey Friars of London*, by C. L. Kingsford, M.A., 1915.



PLAN OF MEDIAEVAL CONDUIT HEAD WITH LATER ADDITIONS, IN GARDEN OF 20, QUEEN SQUARE.

Published by the Society of Antiquaries of London, 1916.



SECTIONS OF MEDIAEVAL CONDUIT HEAD WITH LATER ADDITIONS, IN GARDEN OF 20, QUEEN SQUARE.

Published by the Society of Antiquaries of London, 1916.



Fig. 1. Queen Square : Entrance to staircase leading down to reservoir

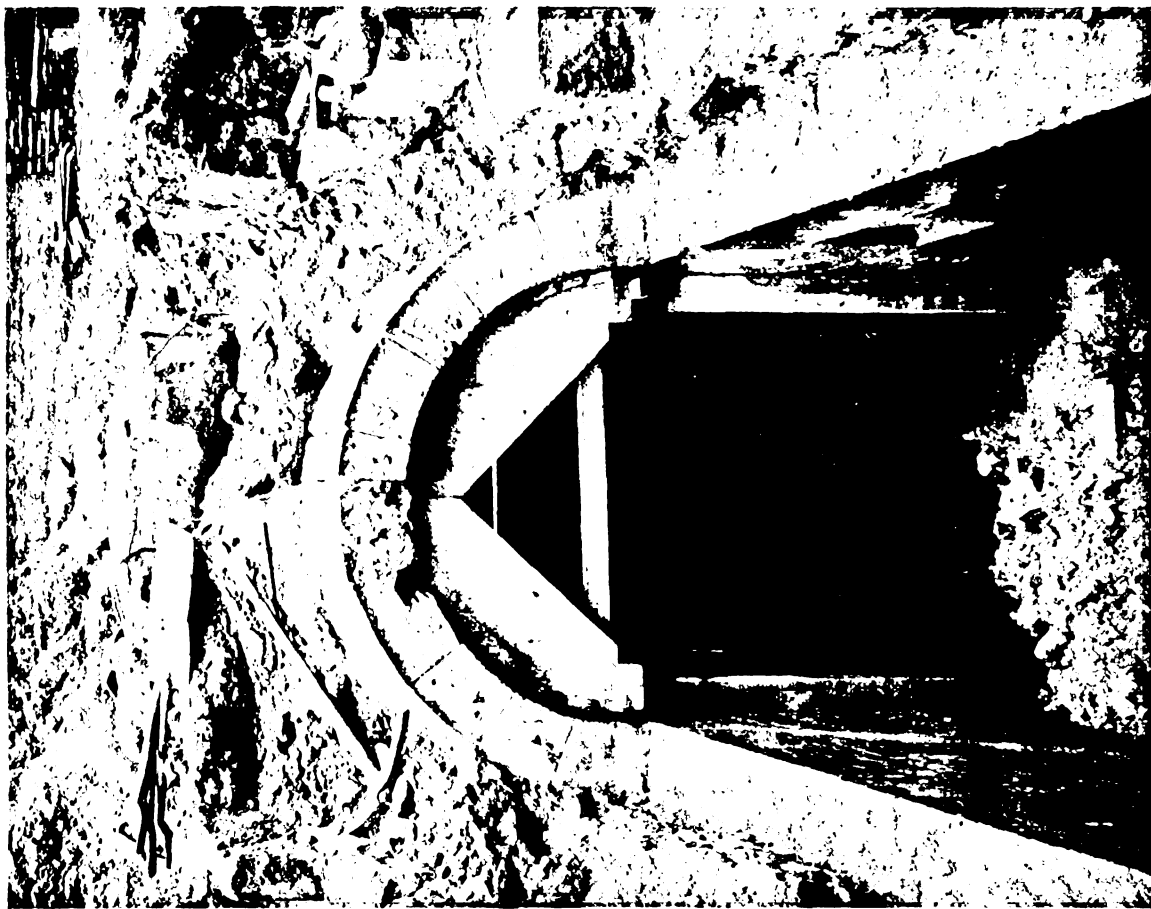


Fig. 2. Queen Square : An arch leading down to reservoir

Published by the Society of Antiquaries of London, 1916

country, about a quarter of a mile farther west, which latterly was in a garden at the back of no. 20 Queen Square, Bloomsbury. The fabric erected there consisted of an underground reservoir or conduit-head, approached by steps down an arched passage, the upper portion of which was originally above ground. In this reservoir water was stored from springs in the neighbourhood, and thence delivered through a leaden pipe to the convent. It is advisable to recall the facts that in 1899 I read a paper before our Society¹ on this farther conduit-head, the origin of which had been forgotten, and that in 1909 Mr. Ernest A. Mann and I described the Chapel Street conduit-head,² which, until then, had escaped notice so completely that even its existence was unknown.

The discovery of the original reservoir was soon followed by the complete removal of the Queen Square conduit-head, which is in fact equivalent to its destruction. For, although the stones have been carefully kept and numbered, there seems at present small likelihood of its being re-erected elsewhere. Besides, almost all the interest of a relic of this kind is lost when it ceases to be on its original site. While, however, it was being pulled down, a chance occurred of adding something to our knowledge of it, and I will now mention what was then discovered, repeating only from previous papers as much as is required in order to make the account intelligible.

When the former convent was handed over to Christ's Hospital the water system was included, and continued in use until the earlier part of the eighteenth century, although before 1665 part of the supply already came from the New River. In Strype's *Stow*, 1720, our conduit-head is called the Devil's Conduit, perhaps because its origin appeared to be mysterious—the 'Devil's Dyke' is an analogous instance. Rocque's map of 1745-6 shows the site in a small square open on the south to Brunswick Court, now Queen Square Place. Some years afterwards the conduit-head, fallen into disuse, was merged in the garden of no. 20 Queen Square, a Georgian house frequented by Dr. Johnson, when the Scottish author Dr. John Campbell lived there, and on Sunday evenings entertained many visitors. At that time the neighbourhood was still fashionable, but in the earlier half of the nineteenth century it gradually lost its vogue. An inhabitant living about seventy years ago is reported to have said: 'When first I came to Queen Square I was the only lady who did not keep a carriage; when I left it I was the only one who did.' Among notable occupants of no. 20 in comparatively recent times was Miss Louisa Twining, who endeavoured throughout a long life to secure improvements in the administration of the Poor Laws, and also wrote a book on Christian Symbols and Emblems. She came there in 1866 and left in 1882. The house then belonged to the Marquess of Salisbury. During her tenancy, as she records, the passage leading to the

¹ *Archaeologia*, lvi, 251-66.

² *Archaeologia*, lxi, 347-56.

conduit-head was seen by Mr. J. H. Parker, the writer on architecture, who thought it might belong to the time of Edward VI, but apparently made no suggestion as to its origin. After Miss Twining left no. 20 it became the home of Mr. T. H. Wyatt, son of the President of the Royal Institute of British Architects, 1870-3.

The aspect of the house from the garden, while still in private hands, is shown by the accompanying illustration (fig. 5). The doorway to spectator's right communicated with Queen Square Place, and close to it was a trap-door leading down to the conduit-head. The only indication of this above ground was a flat



Block kindly lent by the London Topographical Society.

Fig. 5. No. 20, Queen Square, from the garden. (From a drawing by Philip Norman.)

stone in the garden about 2 ft. 6 in. square, with a circular wrought-iron grating, which covered the ventilating shaft of the reservoir, to be described later on.

In 1909 the freehold of no. 20 was sold to the proprietors of the Imperial Hotel, Russell Square, immediately to the west of the garden, which meant that the conduit-head was in imminent danger. Efforts to save it were unavailing, and by the end of July 1911 the work of demolition had begun. There was a great accumulation of made earth, a thickness of 13 ft. or more being dug out before the natural soil was reached. This was here clay, with for the most part a thin layer of gravelly loam above it. On my first visit the stone reservoir was nearly full of water, which, as we found afterwards, percolated not through any pipe but chiefly under the masonry, and was with difficulty got out by pumping.

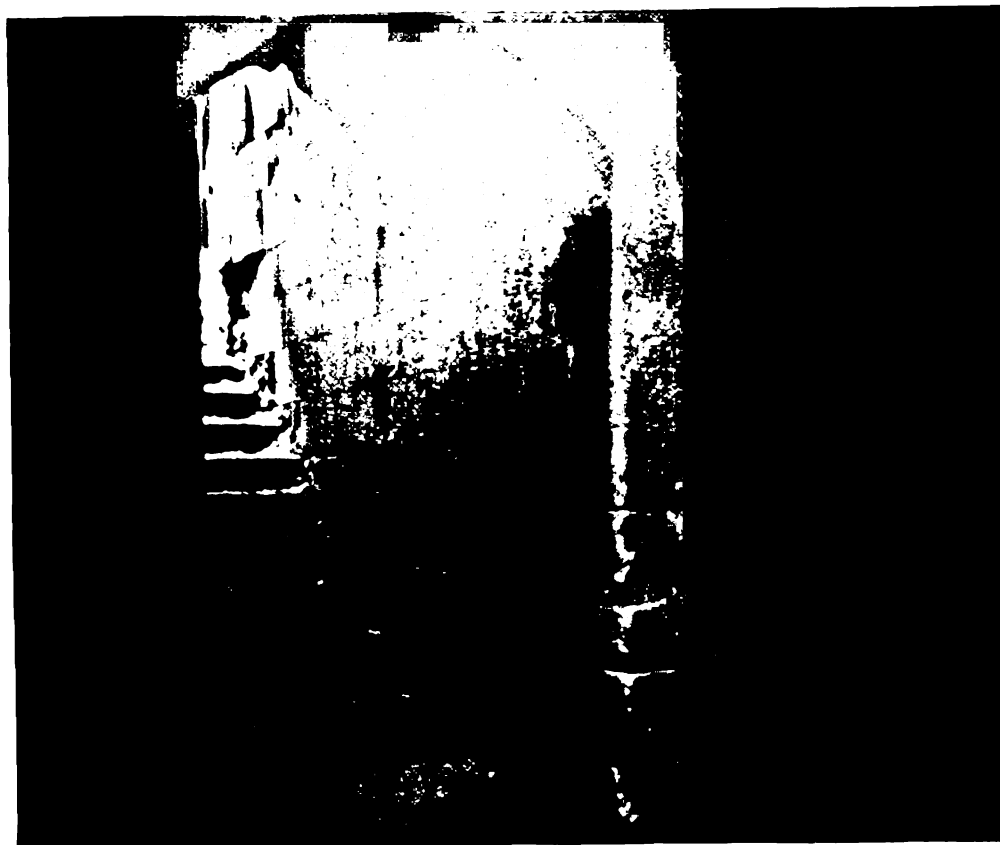


Fig. 1. Queen Square: Staircase from reservoir



Fig. 2. Queen Square: Foot of staircase after removal of upper steps

The following notes supplement my paper of 1899, which, with its measured drawings, is accurate enough so far as it goes. We will take first the interior of the ancient building, then the outside, then the comparatively modern structures connected with it, always bearing in mind that of late years, when the garden was still intact, there was an accumulation of something like 10 ft. of made earth above the floor level of the upper end of the passage to the stone conduit-head or reservoir.

Descending through the trap-door in the garden, and then by a modern stair, one reached a landing, with an eighteenth-century brick archway on the left hand, and in front the entrance to the medieval portion (pl. VIII, fig. 1). This was the first of a series of stone arches, with vaulting above, which covered steps leading down to the reservoir. The jambs of the doorway were original; inside they projected, forming a rebate for a door, two iron door-hooks still remaining. A flat lintel, apparently of Purbeck, had replaced the former arch, of which, however, there was evidence. A very large stone had been built in over the lintel. It will be remembered that the two succeeding arches were segmental (pl. VIII, fig. 2), and had not been tampered with. The steps to the reservoir were but slightly worn, having been renewed at some unknown period (pl. IX, fig. 1). They were then made less steep, and a little platform of the width of two steps was formed at the edge of the water; but evidence of earlier steps was found (pl. IX, fig. 2), the last four being *in situ* beneath the later ones. The jambs of the last archway were carried down as low as the top of the last original step, the base of which was on the floor of the reservoir. These also had a rebate for a door opening inwards, with two iron door-hooks still remaining. Below was a hook for a former door, in use doubtless before the steps were rearranged.

The stone reservoir (pl. X, fig. 1) was of fine ashlar work inside; on some of the stones tool marks were distinctly visible. It had a barrel vault which ran north and south. With slight deviations it was in plan a square of about 10 ft. 6 in. In the seventeenth and early eighteenth century it was generally called the chimney conduit, on account of a shaft or chimney rising from the vault at its southern end,¹ against the entrance arch just referred to. This chimney, where it joined the vault, was 3 ft. in length from east to west, and 1 ft. 5 in. broad, becoming squarer above. The base, where it sprang from the vaulting, was of fine stonework, having evidently existed from the beginning. The upper part of brick, dating from the seventeenth or early eighteenth century, passed through an accumulation of made earth. At the modern garden level

¹ The points of the compass are used approximately. In fact the building stood, not north and south, but north-west by south-east. In this paper south means towards Holborn, north means towards Highgate, and so on.

it was covered by a stone with grating as already mentioned. The vaulting of the reservoir was of the same character as the masonry of the walls, the stones being carefully shaped and laid with narrow joints. The height inside, to the crown of the vaulting, was 9 ft., and the floor was 18 ft. below the garden level. It was composed almost entirely of red paving tiles a foot square, but had let into it, near the north end, a flagstone 4 ft. 6 in. long by 3 ft. There was a stone edge round the tiles mostly about a foot wide. The greater part of it was an inch or two lower than the tiled pavement, forming what looked like a narrow channel; at the north end, however, near the west, they were on a level. This stone edging was rather decayed, so perhaps the depression was caused by its being water-worn.

On the west side, 4 ft. from the north wall and about 2 ft. above the floor, a 3-in. lead pipe, with a lapped joint above, projected into the reservoir. It was plugged with wood, and was not an original opening, as the ashlar stones had been broken to admit it. The original wall of the tank above had also been broken for a space of 3 ft. or 4 ft. and filled up with brick and stone rubble.

In the east wall, close to the north end, there was an oval (nearly round) aperture 6½ in. wide (pl. X, fig. 2), the lower part being if anything below the floor level, which sloped down a little towards this corner. Above was a hole broken in the wall at a later period. Quite close to it, farther south, was a large and irregular opening where stones had been broken away at a somewhat higher level.

To turn now to the outside of the ancient building, the walls of the passage were composed of fine ashlar work, mostly in good condition, which must have been above the medieval ground level. They had rubble foundations, and at a height of one row of stones on each side was a chamfered plinth. The walls of the reservoir were considerably thicker than those of the passage. Its ashlar vaulting was covered by rubble masonry thinnest at the crown. The elevation (pl. VII) and photographs show that the whole or almost the whole of it must have been below ground. The walls of the passage had formed part of the little stone house which was seen from a distance, as described in the Grey Friars Register. It was prolonged slightly to the north over the reservoir. On the west side, near the north end, on the second course of stones above the plinth, and immediately opposite to the ventilating shaft, the sill of a window, or opening of some kind, was found, which is shown in one of our illustrations (pl. XI, fig. 1); its length was approximately 1 ft. 7 in. No indication of a similar opening on the other side came to light. The illustration from the east (pl. XI, fig. 2) is chiefly interesting because it shows the stone base of the chimney and the brick-work which prolonged it through the comparatively modern accumulation of soil above. The north wall of the reservoir was thickest at the bottom, and diminished



Fig. 1. Queen Square: Interior of reservoir after removal of vaulting



Fig. 2. Queen Square: Openings in east wall of reservoir

externally by stages or steps. These are indicated by parallel lines on the ground plan (pl. VI).

It must be added that there was a stone wall prolonging the western wall of the reservoir, of similar substance and construction except that it had no ashlar work. It ran north, even beyond the brick garden wall, a fact that could be verified because the latter was underpinned during the excavation. Under this ancient wall a deep drain ran east and west.

As regards the apertures in the east wall of the reservoir, the oval orifice near the north-east corner soon merged in a square stone channel, traced as far as the wall of the house, and pointing towards the roadway before the gates of the Foundling Hospital. It contained no pipe, but was half full of a very fine sediment. There was a slight fall eastward. Was it merely a drain used at intervals, when the reservoir required cleaning? It would have emptied this completely, and the orifice would have been of convenient form for the insertion of a plug. In the irregular opening about a couple of feet above it (already referred to) traces were found of a leaden pipe. With regard to this no further information is forthcoming; it was clearly not part of the original structure.

The more southern aperture in the east wall communicated with a leaden pipe, the end of which was still in the wall; a joint 6 ft. or 7 ft. to the east had on it the letters wa and date 1578. Where it entered the reservoir, this pipe was contained in a blocked or engaged arch. It was traced east as far as the southern corner of the house, and pointed almost directly to the 'White Conduit'. Although at the time of the demolition its fall in an eastern direction seems to have been hardly perceptible, it must have been an outlet, and in all probability its line indicates that of the original connexion with the Grey Friars water system.

As this outlet was a little above the floor of the reservoir, solid matter carried in from the springs would have settled to some extent, and its removal from time to time would have been necessary. The Queen Square conduit-head, however, like other well-known chambers of the kind, was not a mere settling tank but a place of storage for water flowing in from springs in the neighbourhood, that there might be no sudden failure of supply, and that it might be delivered evenly by gravitation to the convent.

In the plan of the Christ's Hospital water system in 1676, reproduced for a previous paper,¹ the position 'of the severall wells and springs arising about this Conduite Head' purports to be shown. These are all connected, and are six in number—four on the west, one on the north, and one on the east—none of them being very near the reservoir. Photographs and personal observation prove that there was no indication of an outlet or inlet for water anywhere except those in

¹ *Archaeologia*, lxi, pl. xlvi.

the east wall just described, and the breaks in the west wall, one admitting the leaden pipe which survived till the end, evidently a late insertion, and the large break above it, which had been filled up with stone and brick. We are, I think, justified in believing that the stone conduit-head was at first supplied with water entering it through a western aperture, but with regard to the original form of the inlet, or possibly inlets, there is no evidence. The material of this ancient building was chiefly Kentish rag, but on his plan Mr. Quirke of the London County Council describes the ashlar work inside the reservoir as of Reigate firestone.

So far, with trifling exceptions, the remains described have belonged to the original building, the stones of which have been numbered and stored; but there were also important additions, now altogether destroyed, about which it is necessary to say something. Reference has already twice been made to the inlet pipe on the west side of the reservoir. On excavating immediately to the west it was found that, after passing through the wall of the reservoir and through a short brick passage filled up with clay, at a distance of only about 6 ft., the pipe, slightly rising, entered a brick chamber, which was in plan approximately a square of 5 ft., with a barrel vault running east and west, its crown being 12 ft. below modern ground level. It went down to a considerable depth, about 20 ft. below the modern ground level, or 2 ft. lower than the floor of the stone reservoir. It had a brick floor, highest in the middle, and a few relics were found there of no great age—a George I halfpenny and fragments of eighteenth-century stone-ware. High up in the east wall of this chamber was a blocked opening about 2 ft. 4 in. wide; at the west end, on approximately the same level, were indications of a similar blocked opening, both above the line of the pipe. The brick-work generally had the appearance of belonging to the seventeenth or early eighteenth century. At the west end a large hole was broken in the crown of the vaulting, and it was through this hole that the water in this brick tank could be seen from the later brick passage above, the arched entrance of which, close to the ancient doorway of the steps leading down to the stone reservoir, was mentioned in a previous paragraph. Of this upper passage we give two rather picturesque views (pl. XII). One of them shows, to spectator's right, near the end of its tortuous course, a more or less elliptical opening in the floor which communicated with the hole in the roof of the chamber below. It had a low parapet, not shown in the illustration, either because it had been removed or was then concealed by rubbish. The sides of the parapet and of the hole had cockle-shells stuck on them, a style of ornament not uncommon in the latter half of the eighteenth century, and perhaps the brick-work was of the same date. A ladder projected through the hole; it looked comparatively modern.

On the west side of this brick chamber, about 4 ft. above its floor level, there



Fig. 1. Queen Square: Passage down to reservoir from NW. and sill of window



Fig. 2. Queen Square: Wall of passage to reservoir from E. and remains of chimney

was a brick channel, which, at a distance of 4 ft. to 5 ft. towards the west, bifurcated, the more northern branch soon coming to an end, as after a short distance it had been destroyed. That to the south-west was found to be connected with a smaller brick chamber, the internal measurement of which was 4 ft. by 3 ft. 5 in. This tank was built on a mortised timber frame; it had no brick floor, and no roofing was found; its base was somewhat less than 3 ft. above the floor of the larger brick chamber. The walls were about 5 ft. high. A brick channel entered it from the south-west, on the same line as that connecting it with the brick chamber already described. Farther to the south-west other brick channels (merely referred to on the plan) were found branching off in various directions. None of those which have been mentioned contained lead piping. Remains of another brick chamber were found farther west, but of this there is no precise description, nor was it possible to obtain photographs of the two brick chambers of which plans are given.

This concludes the record of discoveries of later remains connected with the conduit-head. To attempt to explain each of them precisely would perhaps be futile, but I venture to repeat a quotation from the Christ's Hospital records which was given in the paper of 1899. In August 1710, after a discussion with Sir Nathaniel Curzon, who owned the ground at the conduit-head, it was visited by the Christ's Hospital authorities. In the words of a minute: 'Severall springs, drains, and cespools' were laid open. The Com^{ttee} ordered that the drains and cespools should be cleansed and covered with stone instead of planks, and new mark stones set down at the severall springs, heads, and cespools where wanting. And if Sir Nath^l Curzon and our Hospitall shall come to an agreem^t then it is proposed to have the cespools and springs in his field arched over with brick that soe they may be the better preserved and easy access had to them.'

With the fragmentary information at our disposal can we decide to what extent these structures resulted from the negotiations of 1710, and what precise purpose they served? As to the upper brick passage, entered through an archway by the head of the medieval staircase, the idea that it was formed for the protection of springs is no longer tenable, because we now see that the brickwork is too recent. Yet an expensive building of such peculiar shape must have been something more than a covered way merely communicating with the larger brick chamber, through which water appears to have been drawn for local purposes after this source of supply had been abandoned by the authorities of Christ's Hospital.

¹ 'Cespool' has not the unpleasant meaning of our modern word cesspool. It is equivalent to cesperill or suspiral, which Sir William Hope, in his paper on the water system of the Charterhouse, explains as a vent to avoid the danger of a pipe bursting by pressure of air or water. It seems likely that they served other useful purposes.

It is likely, however, that the smaller brick chambers below were built as the result of an agreement with Sir Nathaniel Curzon after the year 1710, and that there were formerly other chambers of a similar kind.

As to the brick chamber close to the stone reservoir, connected with it by a lead pipe, and communicating through the hole in its roof with the upper passage, there are two conflicting theories. Was it built to protect a spring or was it of the nature of a settling tank? The main objection to its being the latter is, apparently, that it would be difficult to clean out. Indeed, if the barrel vault were complete there would be no normal means of access to it. But although the hole in the west part of the roof was latterly irregular, suggesting that it was broken some time after the construction of the chamber, perhaps when the upper brick passage was made, this may have been an enlargement, and there may have been an aperture from the beginning. Besides, as I have mentioned, a blocked opening was found at each end. The fact that it was enclosed not only by brick walls but by a brick floor makes one hesitate to believe that it was built to protect a spring, and none is marked at this point on the plan of 1676, though water from springs undoubtedly flowed into it from the west through the brick channel with which the other chambers were connected.

After all, however, what is most important is the medieval stone conduit-head. Our account of this, although there are regrettable omissions, owing chiefly to the fact that much material evidence has perished in the lapse of ages, in part also because there has been no chance of recent communication with the foreman who superintended its removal or with those who did the actual work, at least completes the main evidence about a unique and highly interesting relic which would otherwise have been forgotten.

I beg to thank the London County Council for their great courtesy in allowing the use of excellent plans and photographs, especially to Mr. W. E. Riley, their superintending architect, also to Mr. F. W. Reader and to Mr. C. S. Mason. I must not forget Mr. Fitzroy Doll, the architect, who was most obliging.

This ancient conduit-head has now been replaced by Turkish baths and accommodation for Swedish exercises.



Fig. 1. Queen Square: Brick passage, looking towards entrance



Fig. 2. Queen Square: Brick passage, showing hole in floor leading to brick chamber

II.—*Origin of the Neolithic Celt.* By REGINALD A. SMITH, Esq., F.S.A.

Read 16th December 1915.

ACCORDING to the text-books, the celt is the predominant type of implement in the neolithic period, just as the *coup de poing* (hand-axe) is in the palaeolithic; and it is curious that the relationship between these two widely distributed forms should not have been already demonstrated. It is reasonable to expect that there was some link between at least the commoner implements of these two parts of the Stone Age, now that the great hiatus is reduced to insignificant dimensions; and it is natural to look for transition forms in the great Cave-period, ranging from Le Moustier to the pygmy period (also named after Tardenois). A plausible theory is that the *tranchet* or fan-shaped implement of the Danish kitchen-middens, with its cutting-edge formed by detaching a single transverse flake, was the parent of the neolithic celt; but the *tranchet* is rare outside the Danish area, and quite unknown in the greater part of Europe. On this account alone its claim might be rejected, as the Danish form would hardly explain the celts of Britain and western Europe, not to mention examples in other continents; and its priority in Denmark itself is challenged by still earlier finds (Maglemose), which reveal other and different forms, not associated with the kitchen-midden axe, but linking the early Danish Stone Age with the culture of La Madeleine. In spite of this, the prevalent notion is that the kitchen-middens are the earliest neolithic remains in existence, and that among them must therefore be found the prototype of the celt.

As the *tranchet* is evidently *not* the key to the situation, renewed search is indicated among the Cave-period forms; but, numerically at least, the graver (*burin*) is the leading type of that period, and anything less like the hand-axe or the celt would be difficult to imagine. The graver is found almost throughout three of the four main Cave-divisions, but is remarkably rare in Britain, where, however, the hand-axe and celt are proverbially common. Less persistent and less numerous types from the caves might be thought even less likely to give the clue, especially as the majority of Cave implements are made from the flake (as opposed to the 'core' of earlier and later times); but excavations at Grime's

Graves in the spring of 1914, under the direction of Dr. A. E. Peake for the Prehistoric Society of East Anglia, have provided a mass of fresh material that, in my opinion, throws new light on the origin and evolution of the neolithic celt. On the present occasion there is no need to repeat the arguments on which the dating of that industry is based,¹ but most of those who have examined a large quantity of the specimens, or even the type-series in the British Museum, will I think admit that the worked flints represent a single and homogeneous industry. They are not purely surface finds (though even such are wonderfully unmixed at the Graves), but all presumably date from the time when flint-mining was going on, and the site (which has been deserted ever since) was occupied by a group of prehistoric flint-workers.

In May 1912 I submitted to the Society a paper suggesting that the mines and implements of Cissbury and Grime's Graves dated from the Aurignac period (the second division of the palaeolithic Cave-period), and the mass of evidence since recovered from Grime's Graves only hardens the heart, and if anything throws the date a little farther back. The affinities with the industry of Le Moustier itself are too striking to be accidental; but it requires a strong faith in the unity of the industry to make the deductions which follow as to the 'neolithic' celt.

To spare the feelings of the more conservative I have purposely selected for discussion as many specimens as possible from the cavern of Le Moustier itself and from the brick-earths of our valley-deposits, the palaeolithic origin of both sources being generally accepted. Grime's Graves will be drawn on towards the end of the series, as that inexhaustible treasure-house alone provides a conclusive series of the celt in embryo. Whether the gap between these and the polished celt will ever be filled depends largely on the extent of our archaeological excavations in the future, and no country in the world has a better field for exploration. The title of this paper is so worded as to negative the idea that *the* origin of the celt has been discovered. It is merely claimed that *an* origin is provided by the Grime's Graves series for a form that may well be the parent of the polished celt with pointed butt, whether of flint or other stone. It so happens that the basalt specimen alleged to have been found in one of the galleries of Canon Greenwell's pit at Grime's Graves (*Archaeologia*, lxiii, 115, fig. 16) was of this type. Whatever its true date, the type with pointed butt is now said to follow the blunt-butted celt in Scandinavia, and may have been introduced from Britain like the thin-butted celt.²

It might be argued that Cissbury is the best source for the unpolished (and

¹ *Archaeologia*, lxiii, 109; *Report of the Excavations at Grime's Graves*, 1914, p. 147.

² Ekholm, *Studier i Upplands Bebyggelsehistoria*, i, p. 78, discusses Stjerna's views on this point (*Före Hällkisttiden*, p. 62).

presumably earlier) form of celt; and after seeing several Cissbury-like implements from the river-drift of England, I am inclined to give much weight to this argument, but notice certain differences between the products of the two flint-mining areas which may be due to local influences rather than to any great difference in date. The Cissbury series has been known for a generation, and is not yet fully recognized as akin to the St. Acheul series; the material from Grime's Graves is new, and suggests another line of descent for the 'neolithic' celt. The two schemes are not mutually exclusive, but the less obvious requires more detailed treatment in the present paper.

The discussion of certain coincidences to which attention may now be drawn requires a degree of detachment that is proof against side issues. The question is ultimately connected with the date of the flint-mines at Cissbury and Grime's Graves, but the present paper aims primarily at establishing a certain sequence of forms which seem to bridge the gap (hitherto believed to be impassable) between the 'point' of Le Moustier and the celt, a term that embraces a considerable variety of forms both at home and abroad, but all of the nature of an axe adapted for hafting. To illustrate this sequence several gentlemen kindly exhibited specimens from their cabinets which I had noticed from time to time to be relevant to the subject; and the number of related forms has been greatly added to in the last few months, so that the similarities cannot be regarded as isolated coincidences.

The argument is conducted as far as possible on objective lines, and, while it will be easy to distinguish facts from inference, it may be pointed out that, whether the interpretation be true or false, the parallels remain and challenge explanation.

The more obvious objections to the thesis will naturally have occurred to the author, but a statement is necessary regarding the rule that form is no criterion of date. The rule is a good one, and will not be questioned here; but it is contended that a criterion of date may be found in form-associations. Corresponding groups of flint-forms, commonly spoken of as industries, are not likely to belong to periods far removed from one another, at least in any given district. The modern science of ecology is based upon plant-associations, whether on the seashore or the mountain top, on the chalk downs or the fen-land. There are stray specimens and even stray types in both cases, but normally each period has its peculiar set of implements, just as definite groups of plants live and thrive in their proper environment.

The series under discussion starts with the side-scraper (French *racloir*), familiar to all students of the Stone Age as the commonest type at Le Moustier. It consists of a flake chipped (by continual use) on one face along the side-edge and plain on the other face, which came in contact with the material in the

process of scraping. The longer and thinner edge was naturally selected, and the opposite thicker edge generally included the platform or striking-plane, where the blow was delivered to detach the flake from the core. There are hundreds of cases in which the platform is at or near the middle of the thicker side-edge or back of the implement, and this may be regarded as the simplest and presumably the earliest form of the side-scraper in the period of Le Moustier.

Fig. 1. A typical side-scraper (*racloir*) from the cavern of Le Moustier, of grey to black flint. Though flaked more than usual on the under face, it is selected to show the ordinary kind of flake used for the purpose, with the scraping edge almost straight on the left; and the opposite side, with a fuller curve, thickened for convenience in holding. Christy Collection (British Museum). L. 4 in.

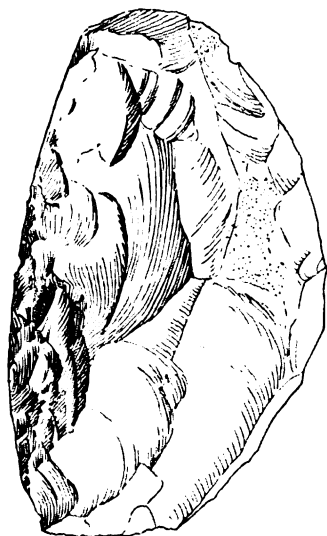


Fig. 1. Side-scraper, Le Moustier, Dordogne. ($\frac{2}{3}$)



Fig. 2. Side-scraper, Le Moustier, Dordogne. ($\frac{2}{3}$)

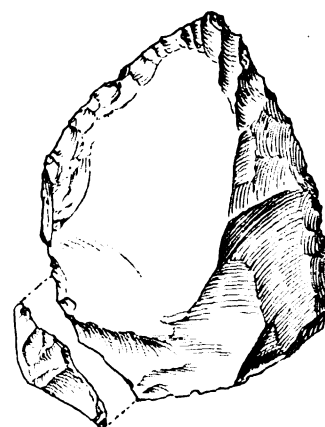


Fig. 3. Flint 'point', faceted, Le Moustier, Dordogne. ($\frac{2}{3}$)

Fig. 2. A side-scraper (*racloir*) ranging in colour from black to grey; the side-edge on the right rather steep, and ending in what is almost a right angle. The bulb is trimmed away, and the lower edge is fairly thin, with a thickening (as is often the case) at the rounded angle or left side of the lower edge. Christy Collection (British Museum). L. 3.4 in.

A good parallel is published from the plateau brick-earth near Liège,¹ 4.2 in. long, with bulb in the middle of the lower edge. The type is common enough, but, apart from the caves of Le Moustier date, attention may be drawn to specimens dated stratigraphically nearer home. Prof. Commont² figures one from Montières (near Amiens, the principal French site for the 'Northfleet'

¹ Marcel de Puydt, etc., *Liège préhistorique: le gisement de Sainte Walburge* (1913), 192, fig. 65.

² *Les Hommes contemporains du Renne*, 118, no. 2.

industry), $3\frac{1}{2}$ in. long, and assigns it to the early stages of Le Moustier; his fig. 29, 4 in. long, is a slightly later phase of the same type.

Fig. 3. A 'point' from the cavern of Le Moustier, made from a honey-coloured flake, with faceted butt on the left angle of the base. It is generally recognized that the point is due to the meeting of two almost straight side-edges, and was not itself functional. Here as usual the longer and straighter side-edge ends below in something near a right angle, and the curved side includes the platform and bulb of percussion, which provides a certain thickness ($\frac{1}{2}$ in.) below the middle. L. 3 in. It may be compared with a specimen from the Ste. Walburge brick-earth, Liège.¹

A 'point', with the lower edge ending in a sharp and a rounded angle, is dated early Le Moustier by R. R. Schmidt,² and there can be no doubt that this characteristic, both of the side-scraper and 'point', is fairly constant, and

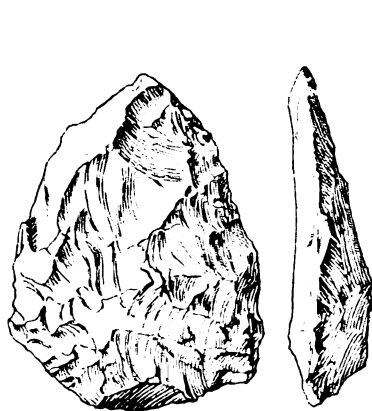


Fig. 4. Hand-axe, front and side views, Ickleford, Herts. ($\frac{3}{8}$)

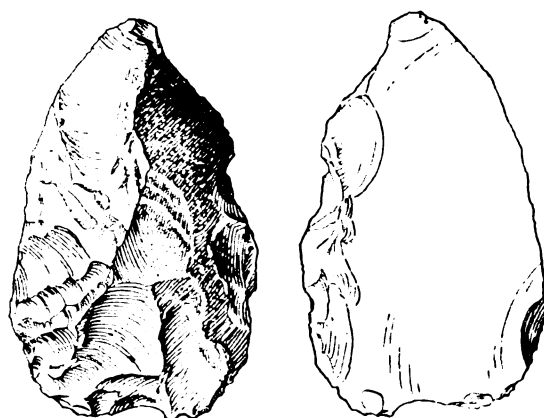


Fig. 5. Side-scraper, front and back views. Ickleford, Herts. ($\frac{3}{8}$)

no mere accidental variety. Sir Ray Lankester has a fine specimen of the 'point', with all these characteristics, from the well-known source of Levallois flakes—Levallois-Perret, a suburb of Paris. It measures 4.2 in. \times 2.4 in., and has a zigzag trimmed edge below.

The neighbourhood of Hitchin has been known for some years as productive of an unusual series of flint implements that have, however, not been closely studied. They come from the brick-earth, which has, on the other hand, received a good deal of attention from geologists, and an analysis of the types represented may result in fixing the archaeological date of a critical geological deposit. It is owing to the kindness of Mr. Fred. Sadler that I am able to include illustrations of a group in his collection, five specimens very similar in patination and general condition, and all from the brick-earth at Ickleford,

¹ Marcel de Puydt, etc., *Liège paléolithique*, fig. 61.

² *Die diluviale Vorzeit Deutschlands*, 127, fig. 43; *Zeitschrift für Ethnologie*, 1911, 956, fig. 13.

1½ miles north of Hitchin, in one of the most important gaps in the Chiltern range. Reference to finds in the neighbourhood are given by Sir John Evans (2nd ed., p. 536).

Fig. 4. Subtriangular implement flaked on both faces, with slightly twisted side-edges: white patina, with traces of indigo on one face. Edge interrupted in centre of base by a facet resembling a striking platform, the latter sometimes occurring in that position during Le Moustier times. The flatter curve (right) resembles a side-scraper, and terminates below in a right angle; on the left, a fuller curve rounded below. L. 2.6 in.

Fig. 5. A side-scraper (*racloir*) made from a dove-coloured flake, lustred and sharp. The front convex with crust towards the right, and trace of indigo in the patina. The back is plain under the scraping edge (right), and rudely flaked on the other edge. Characteristic Le Moustier work, with a thickening at the base of the scraping side-edge. L. 3.1 in.



Fig. 6. Ovate hand-axe, front and side views, Ickleford, Herts. (½)



Fig. 7. Ovate hand-axe, front and side views, Ickleford, Herts. (½)



Fig. 8. Ovate implement, front and side views, Ickleford, Herts. (½)

This and the preceding specimen may be regarded as links in the chain of evolution; the next three are illustrated as interesting in themselves and examples of the types found together in the brick-earth, and characteristic of the latest Drift or earliest Cave-period. The most promising method of adding to our knowledge of the Stone Age in Britain is to illustrate the various specimens found together in a stratified deposit, flints that may be considered homogeneous and free from earlier or later admixtures. The overlap of ovate or cordate implements and the type with one flat face (fig. 8) is chronologically significant.

Fig. 6. A very twisted ovate implement, yellowish, with spots of gloss and patches of indigo. It is unabraded, with edge all round and a thin sharp point. A well-worked implement not unlike a series from the brick-earth at Wansunt, Crayford (*Archaeologia*, lxxv, 208, and pl. xxiii). L. 3.2 in.

- Fig. 7. A greyish white hand-axe, roughly flaked on both faces, edge all round and rather zigzag, the point sharp and sloping with slight notch. Very like the Wansunt brick-earth series. L. 2.5 in.
- Fig. 8. Ovate implement with flat and highly convex faces, almost dove-colour with indigo patches. The point is broad and sloping, with a notch, and there is an edge all round, rather steep. The under face is dressed flat (not a plain fracture), and the scaling on the left side-edge is characteristic of Le Moustier. L. 3.2 in.
- Fig. 9. Triangular so-called 'point' of coarse, rather translucent brown flint, the under face quite flat and plain. Both side-edges have been used as scrapers, and the base is blunt with slight hinge fracture. The contrast between the two lower angles is not pronounced, but still exists; and there is a marked approach to symmetry in the sides. The occurrence of this specimen at Le Moustier does not in itself prove that this stage was reached in the earliest division of the

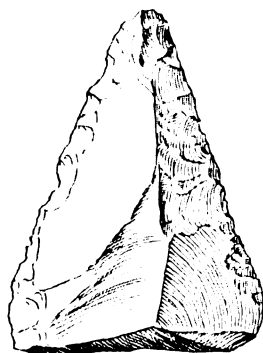


Fig. 9. 'Point', Le Moustier, Dordogne. ($\frac{3}{4}$)

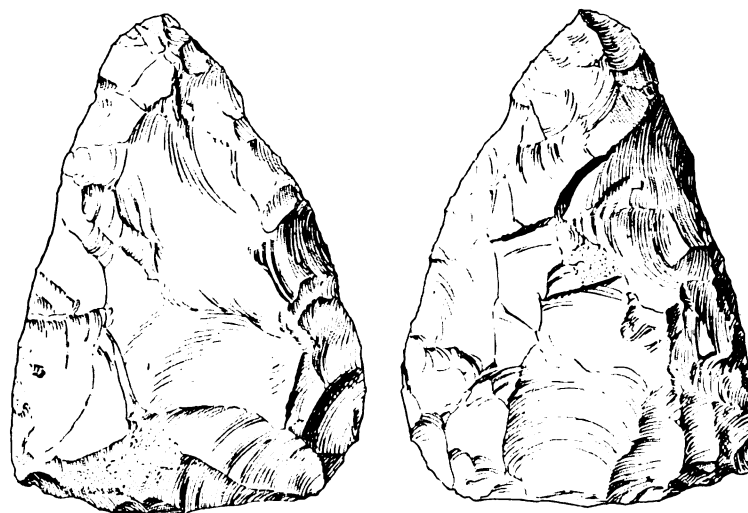


Fig. 10. Hand-axe, front and back views, Le Moustier, Dordogne. ($\frac{3}{4}$)

Cave-period, as the upper level there is now known to contain an Aurignac culture, but there is no chance of the present specimen being later than Aurignac. It is 2.6 in. long, from the Christy Collection in the British Museum, and may be compared with one from Montières, near Amiens, illustrated by Obermaier (*Steingeräte des französischen Altpaläolithikums*, 75, fig. 120).

Though it is easy to imagine a development on these lines, it must be borne in mind that the period of Le Moustier is generally regarded as one of retrogression, and on the whole the tools of this period lose in appearance what they gain in efficiency. The change was due to the adoption of the flake rather than the core as the basis of the earliest Cave industry, and the aim of Le Moustier man was to produce as serviceable an implement as the hand-axe of his predecessors, but with half the labour. One face was a simple fracture with

no surface flaking, and, on these general grounds as well as on the stratigraphical evidence, it is clear that the double-faced implement was evolved before the flake-implement of Le Moustier, though there are reasons for supposing

that the former type survived the earliest Cave-period, and eventually influenced the celt-like implement that passes into the neolithic. The triangular hand-axe of late Drift date is well known from France, especially from Poitou (Coussay-les-Bois, etc.), and is assigned by Prof. Comont to the earliest stage of Le Moustier in the Somme valley and its neighbourhood.¹ Deep in brick-earth (*limon Hesbayen*) at Ste. Walburge, Liège, on the plateau 460 ft. above the Meuse, and 660 ft. o.d., was found a good specimen 'of St. Acheul type',² and R. R. Schmidt dates the type late St. Acheul or transition to Le Moustier.³

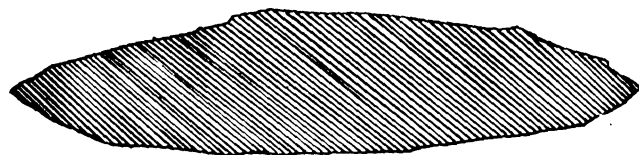
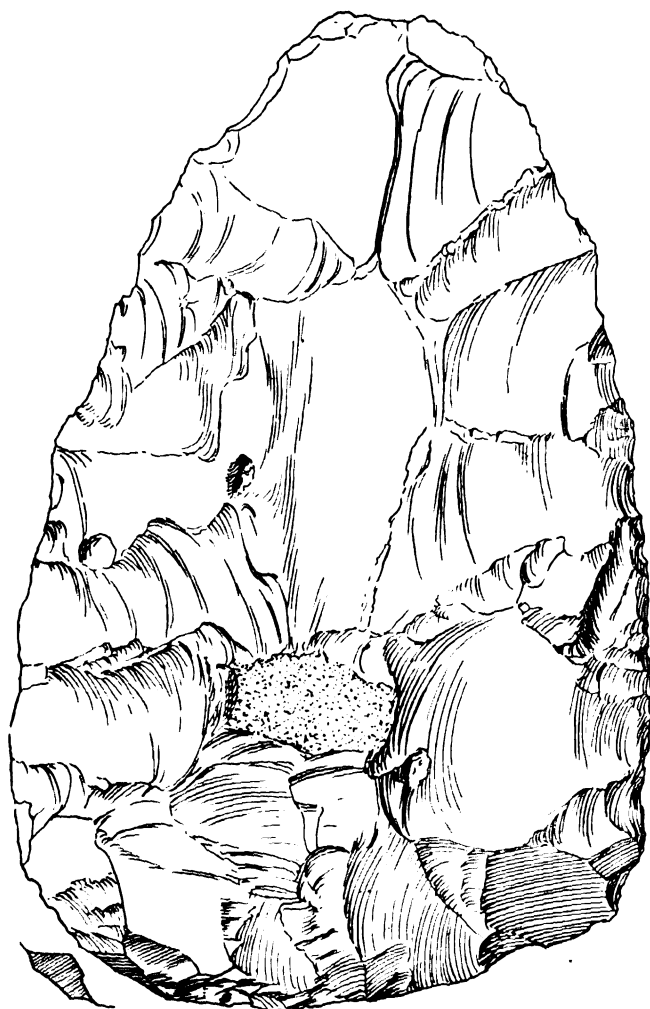


Fig. 11. Hand-axe, with lateral butt and section, Thames at Tilbury. ($\frac{2}{3}$)

Fig. 10. Double-faced implement, not a *racloir*, as it is flaked all over both faces. Black, and quite sharp, with two small patches of crust; the point thin, and base sharp, with imperfect striking-platform at the rounded angle. The other angle, at the base of the straight side-edge, is fairly pointed. From the cavern of Le Moustier, Dordogne (Peccadeau de l'Isle Collection). L. 3.9 in.

seen to be well represented in England. There is a patch of crust near the middle of one face, the latter being yellow, and merging into black just below

¹ *Les Hommes contemporains du Renne*, pp. 92, 178, 210, 255, 303, 304, and plate opposite p. 244.

² Marcel de Puydt, etc., *Liège paléolithique* (1913), 162, fig. 9: length, 2.3 in.

³ *Die diluviale Vorzeit Deutschlands*, 124, fig. 32; *Zeitschrift für Ethnologie*, 1911, 954, fig. 9.

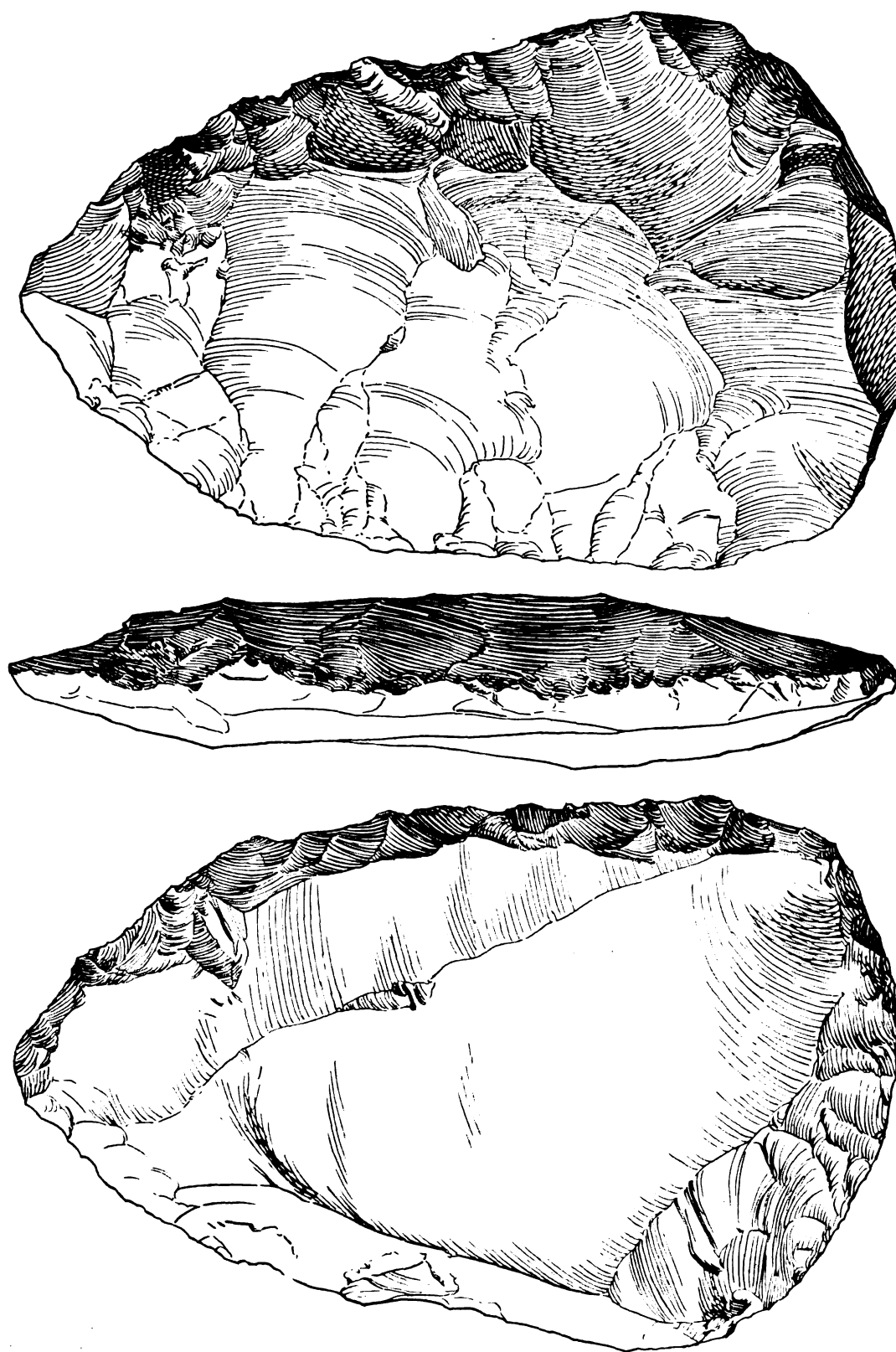


Fig. 12. Front, side, and back views of implement from Grime's Graves, Norfolk. (3)

the crust. The other face is darker yellow, almost ochreous, and has one or two recent chips. There are signs of use on the cutting-edge, which is even and straight, and runs all round except for a transverse facet at the bottom of one side, which is not so angular as the other. The flaking is bold and skilful, the extreme thickness of the implement being 1.1 in. From the Thames at Tilbury (W. G. Smith). L. 7.5 in.

Another specimen (fig. 12) of the same general form and almost of identical outline, though thicker, was found years ago at Grime's Graves, and is now in the collection of Mr. C. E. Allnutt. It is of lusted greyish-white flint, boldly flaked on both faces, one of which has lost a large flake struck from the lower angle, and resembles the upper face of a tortoise-core. The length is 8.3 in., and maximum breadth 5.1 in.

If figs. 11 and 12 can be associated chronologically as closely as they are allied in form, many other large specimens found on the surface will fall into line, and serve to correct the superstition that surface-finds are neolithic. For instance, the late Mr. Allen Brown felt bound to classify as pre-neolithic (his 'mesolithic') a specimen, 8.8 in. by 4.2 in., found on the downs at East Dean, near Eastbourne, Sussex, which he illustrated in *Journ. Anthropol. Inst.*, xxii, 98, pl. iii; and a large hand-axe from his collection (now in Dr. Sturge's museum) found 4 ft. deep in brick-earth at Iwer, Bucks., may also be mentioned in this connexion. It measures 8.7 in. by 4 in., thus agreeing closely with the East Dean specimen, but is more massive, and not so triangular as the above.

Some of the triangular hand-axes mentioned in the Grime's Graves Report (p. 155) have a platform or thickening at one angle of the base, and two in that list are now illustrated by kind permission of our Fellow Mr. Garraway Rice.

Fig. 13. White triangular implement damaged at the point, the straighter side-edge ending below almost in a right angle with a small patch of crust on one face not interfering with the edge-line; and the other side-edge ending in a striking platform interrupting the edge. The lower edge is chipped sharp as if for cutting. From one of the gravel-pits at Yiewsley, near West Drayton, Middlesex. L. 4.4 in.

Fig. 14. Triangular implement, creamy-white on the convex face and bluish on the other, which is trimmed nearly flat; both side-edges are slightly curved, and one end of the sharp lower edge is more angular than the other. From Copton-in-Preston, Faversham, Kent. L. 3.5 in.

Our Fellow Mr. Dale appropriately exhibited two specimens of this type, one of which has been already illustrated in our *Proceedings* (xxiv, 114, top right). It is creamy-white on one face and slightly bluish on the other, with a pronounced twist on the more curved side-edge; about the middle of the base is a patch of crust interrupting the cutting-edge. It is 4 in. long, and was found in a gravel-pit at Dunbridge, in the Test valley, Hants. The second is referred to later (p. 47).

Similar specimens are recorded in the Grime's Graves Report (excavations of 1914), or have since been noticed, from the following sites, arranged by counties:—*Middlesex*—Acton (3), West Drayton; *Suffolk*—High Lodge (Mildenhall), Elvedon, Santon Downham; *Norfolk*—Thetford, West Tofts; *Kent*—Oldbury rock-shelter, Copton-in-Preston; *Wilts.*—Fisherton; *Hants*—Dunbridge. Also specimens from the cave of Le Moustier itself.

The next specimen¹ is simply marked Taplow, but few would hesitate, on examining it, to class it as palaeolithic, and yet it leads on to a group which has been regarded as distinctly later, and assigned to the neolithic period because of a certain similarity to the polished celt.

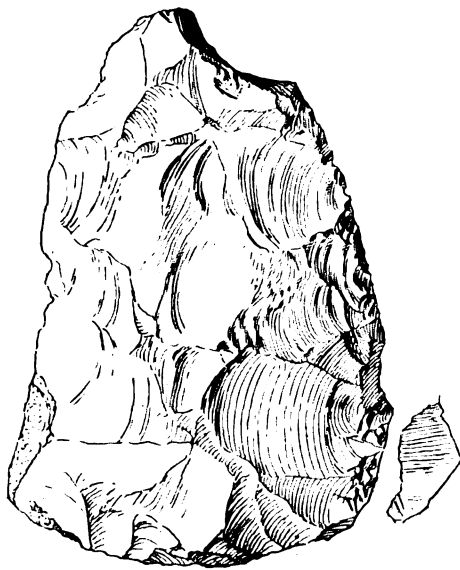


Fig. 13. Implement with lateral butt (drawn separately), Yiewsley, Middlesex. ($\frac{2}{3}$)



Fig. 14. Implement from Copton-in-Preston, Kent. ($\frac{2}{3}$)

Fig. 15. Subtriangular implement patinated white with indigo mottling, with one face trimmed flat and the other convex, thickest near the middle line. In plan the side-edges are unequally curved; and the lower edge, which is as sharp as the other, approaches a straight line, angular at the left end, curved and thickened on the right. Perhaps found in the brick-earth deposit at Taplow; from the collection of the late Mr. Richard Jones, of Welling. L. 3.7 in.

Probably from a neighbouring brick-earth deposit at Lent Rise, Taplow, came a specimen exhibited by Mr. W. C. Wells. It has a creamy patina on one face, the other being mottled grey. There is a cutting-edge all round, not even interrupted at the more rounded end of the base; and both as regards the curve

¹ This illustration and figs. 16–19, 22, and 25 have been kindly lent by the Council of the Prehistoric Society of East Anglia, and were originally published in the Grime's Graves Report (1915).

of the side-edges and that of the base, there is an approach to symmetry. It measures 4.1 in. by 2.7 in.

Fig. 16. Implement with blue-black and blue-white faces; a point at one end and cutting-edge all round, that below being straight, the others curved in plan. One face is trimmed flat, the other has a longitudinal ridge, not central, sloping steeply to the edges. On the left of the lower edge as drawn is a sharp right angle, on the right a blunt curve. From a 'floor' or deposit about 1 ft. below the surface, numbered 3 c, at Grime's Graves, Weeting, Norfolk. L. 3.7 in.

Figs. 15 and 16 are placed side by side to emphasize their resemblance in length, outline, and section, and a close examination reveals several coinci-

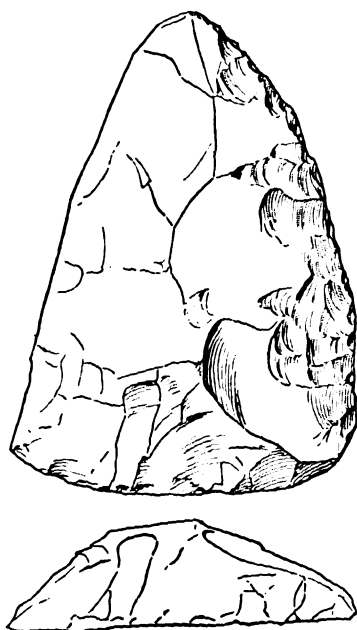


Fig. 15. Front and end views of implement with one flat face, Taplow, Bucks. ($\frac{2}{3}$)



Fig. 16. Front and end views of implement with one flat face, Grime's Graves. ($\frac{2}{3}$)

dences that indicate but little difference in origin and date. Common to both are the pointed top (or butt, if the celt-form is insisted upon), the unequally curved side-edges (the straighter line being on the left of both figures), the sharp point at the lower end of the left side, and the rounded angle below the right side-edge, the sharp, almost straight, cutting-edge below, the back trimmed flat and the front convex. Their lengths are identical, their maximum thickness the same, and the difference in their maximum widths 0.8 in. Both are sharp and unrolled, and have on the right of the front that peculiar scaling that is characteristic of Le Moustier, and is well exemplified in a large chopper from Grime's Graves that can be matched from the cavern of Le Moustier. Of the

two, that from Taplow should be the earlier type, the compression of the sides marking the next stage of development and the transition from the flake-
implement to the celt.

Fig. 17. Celt-like implement, remarkably thick and heavy, and made of inferior flint (probably the local 'wall-stone'), dull black. It has a pointed butt and broad cutting-edge below. Found on the tip from three galleries of the first pit excavated at Grime's Graves in 1914 (*Report*, p. 157), but almost certainly from gallery 11. L. 4.9 in. It has an exact parallel from the Graves, found at the entrance to gallery 5 in the second pit. In both the section is roughly triangular,

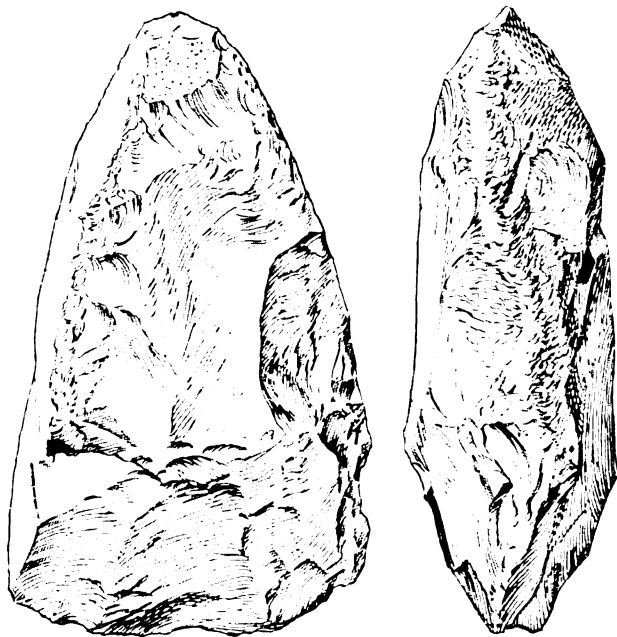


Fig. 17. Front and side views of heavy 'celt', Grime's Graves. (3)

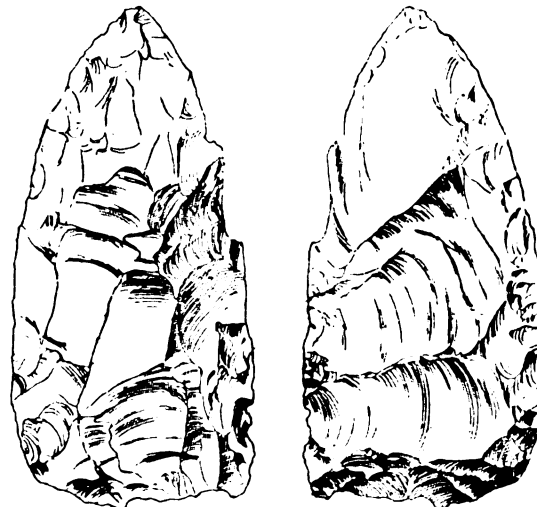


Fig. 18. Faces of thin 'celt', Grime's Graves. (3)

one side being squared: the other side of the illustrated specimen is zigzag, whereas in that from pit 2 this side is straight. Both have a peculiar bruising on the edges as if to blunt them, recalling the 'pique' of certain Scandinavian celts.

A comparison of figs. 15 and 17 is at first discouraging, but their outlines agree in all essentials, and the fact that the heavier implement was associated with others clearly allied to fig. 17 suggests that the difference is mainly one of material, a factor that is apt to be overlooked in comparing flint industries of different localities.

Fig. 18. Implement with blue patination, with a superficial resemblance to a celt but more closely allied to the 'point' of Le Moustier. The front is convex, and the back flatter with some transverse flaking. The upper end is pointed, and the edge

carried all round, the edge-working in this specimen being confined to the flatter face. Found at a depth of 14 ft. in the second pit excavated at Grime's Graves in 1914 (*Report*, p. 163). L. 5.2 in. What seems to be a parallel form, but an inch larger, is figured by Engerrand, *Six leçons de Préhistoire*, III, fig. 37, and described as a 'coup de poing de forme allongée', from Binche, Belgium.

- Fig. 19. Flake-implement, subtriangular, with characteristic bulging curve on the side. The butt (or upper end) is trimmed on both faces to a point, and the cutting-edge (or lower end) is as usual angular at one end and rounded at the other. One lateral edge is zigzag, the other worked or used on one face only, in the style of Le Moustier. The cutting-edge has a thin transverse flake removed (like a *tranchet*) from one face, and is trimmed in more usual fashion on the other. Comparison may be made with one of Le Moustier period figured in Forrer's *Urgeschichte des Europäers*, p. 57, pl. XIV, fig. 6. From a 'floor' or deposit just below the surface, numbered 13, at Grime's Graves, Weeting, Norfolk. L. 3.2 in.



Fig. 19. Characteristic 'celt', Grime's Graves. (3)



Fig. 20. Flake-implement, Weeting, Norfolk. (3)

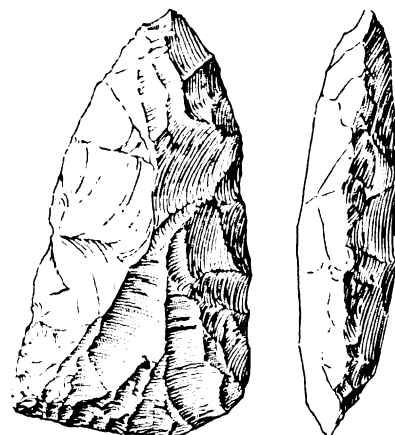


Fig. 21. 'Celt', front and side views, Santon, Norfolk. (3)

- Fig. 20. Bluish-grey triangular flake-implement, with dull lustre and spots of iron-mould. It is flaked over most of both faces. Along the straighter side (left of figure) there is a *racloir* edge, the front being plain, but the other side is chipped on both faces and is curved at the base. The lower angle on the left has apparently been broken, but probably formed a right angle, as at present. The maximum thickness (0.45 in.) is near the middle, and the lower edge is as sharp as the others. Collected by Canon Greenwell at Weeting, Norfolk. It is a thinner duplicate, and probably a predecessor, of Mr. Clarke's specimen from the same neighbourhood (fig. 21). L. 3.1 in.
- Fig. 21. Implement equally convex on the two faces and sharp all round: brightly lustrous surface, grey merging into black, with slight iron-staining on the ridges. Secondary work on the side-edges of the face not shown, and also on the front lower edge, in this respect resembling a specimen (fig. 18) from Grime's Graves (fig. 36 of the *Report*). At the left of the lower or cutting-edge is a sharp right angle, the

opposite end being curved, but the edge not interrupted (as often) by the striking-platform. Found by Mr. W. G. Clarke at Santon, Norfolk (two miles south of Grime's Graves). L. 3.3 in.

It is quite possible, therefore, that the triangular implement with one flat face, and sharp and rounded angles at the base, is an attempt to represent the triangular hand-axe of late Drift times by a flake-implement; in which case the platform may carry on the tradition of a flat facet at one side of the butt,¹ common throughout the Drift period. It seems, however, none the less true

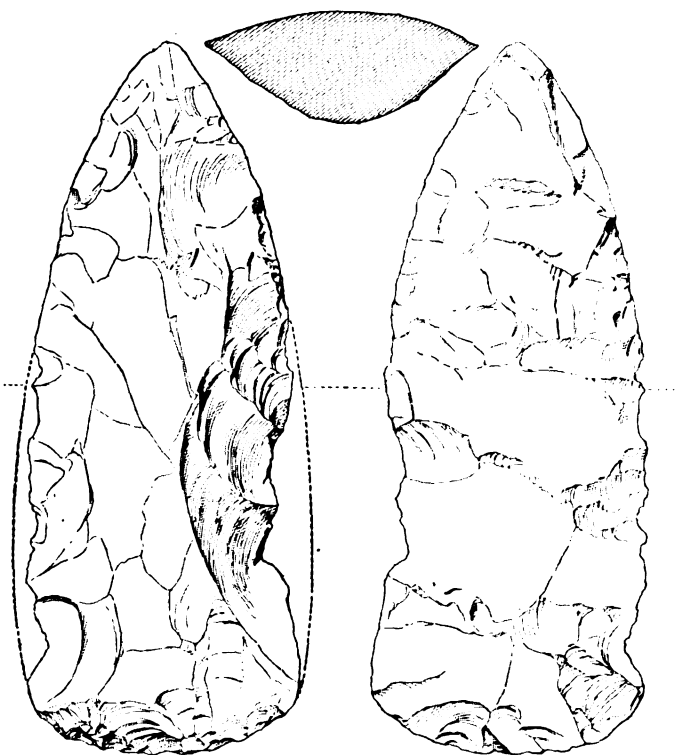


Fig. 22. Faces and section of 'celt', Grime's Graves. ($\frac{2}{3}$).

that the Grime's Graves type was derived from the side-scraper and its companion the 'point', whatever the influence of the triangular hand-axe that marked the close of the Drift. A later link in the chain here represented is an implement with two equally convex faces, but asymmetrical at the broad end, where the sharp rounded angles are still retained. The base of this triangle now seems to have become the cutting-edge, and the apex must henceforth be regarded as the butt, as in the polished celt of later times. This reversal of function is admirably illustrated by the Grime's Graves series, and

¹ Prof. Comont calls this *poignée latérale*, and 'lateral butt' may serve to denote this peculiar thickening of the edge.

marks the birth of the celt, the next specimen to be described having two convex faces and a symmetrical cutting-edge.¹

With regard to the transition from the asymmetrical to the symmetrical form of the 'point', independent evidence can be found in Dr. Schmidt's survey of the German Drift period.² A specimen attributed to mid Le Moustier times has only the slightest trace of asymmetry, and forms a most satisfactory link

between such specimens as figs. 2 and 22. It is important to have this stage in the evolution of the celt dated on the strength of associations elsewhere, as English specimens are nearly always from the surface, and therefore of little chronological value in themselves.

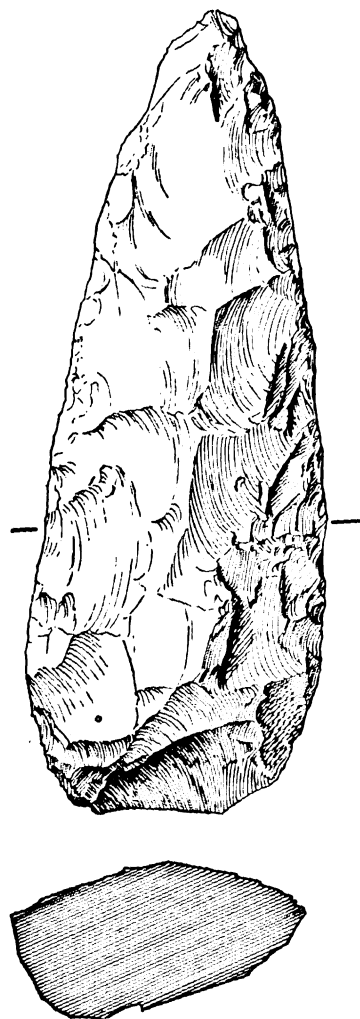


Fig. 23. 'Celt', front and section, North Cray, Kent. ($\frac{3}{8}$)

Fig. 22. An implement that may be described as a celt, as it corresponds in all essential features to many unpolished specimens assigned to the neolithic period. It is incomplete at the sides, and the probable curves are supplied in one of the drawings. It has a sharp point at the upper end and (originally) a cutting-edge all round, a zigzag tendency being noticeable. The faces are unequally convex, the flatter being mostly flaked transversely, the other rather diagonally. From the black layer (fourth from the top) at a depth of 10 ft. in the first pit excavated at Grime's Graves, Weeting, Norfolk, in 1914: see *Report*, p. 154. L. 7.5 in.

Fig. 23. A celt-like implement, mainly bluish-grey, with beginnings of white patina on the more convex face, which has some crust along the middle. The flatter face is flaked all over, one side-edge even and straight, the other rather zigzag: the butt pointed, and the cutting-edge straight, with a transverse flake detached on one face much in the kitchen-midden style. The edges are sharp, and the surface is fairly lustrous. North Cray gravel-pit, Kent. L. 6.1 in.

¹ This stage is well illustrated by a specimen found since the reading of this paper by Mr. Angus Lyell, the soldier-son of our Fellow. It was thrown out in trench-digging between 1 ft. and 1½ ft. from the surface at Broughton, near Banbury, and lay in heavy red soil on high ground. Its length is 4½ in. and maximum thickness 0.8 in., the lower edge being sharp but notched, and one edge twisted. The faces are both trimmed convex, and the base is symmetrical. Two scrapers resembling Aurignac types were found on the surface of the same field.

² *Die diluviale Vorzeit Deutschlands*, 127, fig. 44; *Zeitschrift für Ethnologie*, 1911, 957, fig. 14.

This remarkable specimen was collected by the late Capt. Arnold B. Vansittart from the alluvium of the North Cray gravel-pit; though said to have been found some time before the discovery of the working-floor,¹ it may possibly be of the same date as a large number of long flakes (many of which have been fitted together) from just above the gravel. Comparison with fig. 22 renders this more probable than would at first appear, and the specimen has features that are not in favour of its being intended for polishing—the usual explanation of a chipped celt.

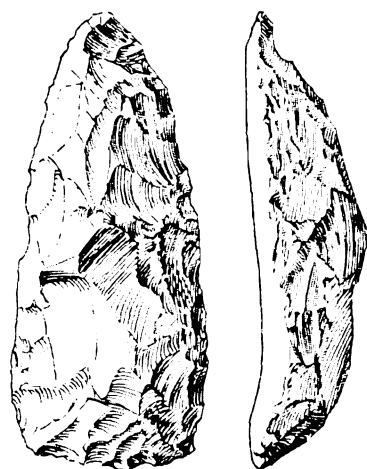


Fig. 24. 'Celt', front and side views, Weeting, Norfolk. (3)

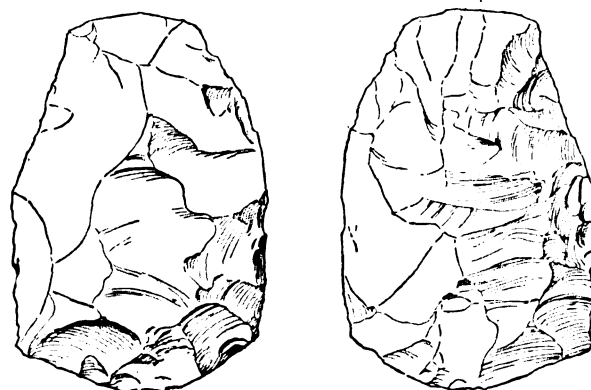


Fig. 25. Faces of broad-butted 'celt', Grime's Graves. (3)

Fig. 24. Implement of triangular plan, lustred and dove-colour all over, but slightly darker on the flat face. There are later chips at both ends, and the notch seen in the side-view at the top is accidental, the convex curve being originally continuous. The front (highly convex face) has nearly all the iron-staining, and in the middle some delicate scratches that are also seen on the unchipped part of the flat face. The difference in the lower angles is not pronounced, but the left is thick, and the right thinner and sharper. Found by Mr. E. T. Lingwood at Weeting (near Grime's Graves), Norfolk. L. 3.6 in.

Fig. 25. A variety of the celt-like implement so well illustrated by the recent discoveries at Grime's Graves, but exceptional in regard to its upper end, which is broad, not pointed as usual. The back is black and fresh looking, the front a bluish-white, and the broad cutting-edge rounded, with fairly symmetrical ends. This variety is known from Cissbury, and something very like it occurs in the gravel, as for instance one from Partridge Hill in Reading Museum; hence it is not necessary to suppose a pointed butt (or upper end) has been broken off. From a 'floor' or deposit about 2 ft. below the surface, numbered 3 b, at Grime's Graves, Weeting, Norfolk. L. 3 in.

¹ *Proc. E. Anglian Preh. Soc.*, ii (1915), 94.

It might be objected that, on the assumption that the Grime's Graves industry is contemporary and homogeneous (a hazardous assumption, as many would think), the evolution of the celt should not there be exhibited in all its stages; in other words, the original side-scraper and the symmetrical 'celt' (as fig. 22) ought not to have existed side by side. Evidence has already been given of the gradual approach to symmetry in the mid Le Moustier period, yet few would assert that the side-scraper then passed out of fashion, and the difficulty is best met by dating the industry by its latest features, and yet not excluding the more primitive forms that still served a useful purpose. In modern times the machine and hand-tool exist together, doing the same kind of work with unequal speed and efficiency, but each having a special function that cannot be as well performed by the other. The pen is not yet obsolete, though the typewriter can do the same kind of work, in many cases more efficiently; they are now contemporary, but the evolutionary stages between them extend over many centuries.

There is now some prospect of determining the exact point at which the celt is introduced into the acknowledged sequence of Stone Age types. It is in or just after the period known as Le Moustier, and in this connexion it must always be remembered that the upper levels of that cave-deposit yielded to the late Capt. Boursoul (one more victim of the war) transition and pure Aurignac specimens. It is to the latter period that the available evidence points, and if fig. 22 stands on the confines of Le Moustier and Aurignac, then fig. 23 may represent the next stage and date from the full Aurignac period. This will appear revolutionary, and it is by no means certain that fig. 23 came from the same deposit as the conjoined flakes, though all were found in the same gravel-pit at North Cray. Yet it is significant that these very conjoined flakes have been examined by Prof. Commont and assigned by him to the later Aurignac period,¹ very near to Solutré. This attribution, based on similar finds in the Somme valley, will be received with respect; and the date would also suit the celt on typological grounds, the type having thickened in the interval without changing its outline to any great extent.

If then the beginnings of the Aurignac culture are recognized at Grime's Graves, it may be argued that earlier forms belong to the later stages of Le Moustier, and in this category would be included the tortoise-core and flake-implement with faceted butt, both so fully exemplified at Northfleet. The equation is of some chronological importance, for the Northfleet industry is identical with that of Montières, near Amiens, which in Prof. Commont's opinion belongs to the early stages of Le Moustier. The point will no doubt be settled

¹ *Proc E. Anglian Preh. Soc.*, ii, 97.

by further excavation; but the English evidence certainly suggests that other well-known deposits of Le Moustier date, but devoid of the faceted butt, represent the earlier stages of that Cave-period, such as High Lodge, Mildenhall, Suffolk; Hitchin, Herts.; and Dovercourt, Essex.

Whatever be the interpretation of the new evidence obtained by excavation at Grime's Graves, it is natural to inquire what is the relation between the celt-like implements from that site already discussed and the polished celt that has always been regarded as the leading type of the neolithic period. The general resemblance is confessedly striking, and is only emphasized by a more careful examination. The Taplow specimen (fig. 15) is, in outline, very similar to a much heavier and coarser implement from the Graves (fig. 17), which, apart from other evidence, and perhaps in any case, would be classified by most as a neolithic celt. A combination of figs. 17 and 23 would give the 'chipped celt prepared for polishing' of the text-books; and the finished article, the polished celt with oval section and pointed butt, has further an asymmetrical cutting-edge exactly parallel to that of the Grime's Graves group—with one important reservation. Whereas the latter type was chipped into asymmetry, the polished celt may have been reduced to that condition by hard wear. A scaffolder's axe, for instance, at the present day is made with equal angles at the ends of the cutting-edge, but from use and sharpening the upper angle (that farthest from the striker) soon wears down to a curve, and the same was apparently the case with the polished celt. A large proportion of polished celts have an unsymmetrical cutting-edge, which may be due to design, to wear, or to re-sharpening. Opinions differ as to the relation of the sharp and rounded ends of the cutting-edge to the haft, and much seems to depend on the use to which the axe is put.¹ For instance, the upper angle would be rounded in a tree-felling axe, but the lower angle would be the more worn in cutting up blocks into firewood. Several neolithic celts have been found in the original shaft, but illustrations do not settle this point, and there is always a possibility that the axe has been removed and replaced in another position. In any case it seems clear that the earliest form of celt often had one end of the cutting-edge left blunt intentionally.

The connexion between the typical Cissbury celt and the neolithic axe is in some ways more easy, and in others more difficult, to deal with than the descent through the Grime's Graves series. In a sense not applicable to Grime's Graves, there is a celt-like type numerous enough at Cissbury to justify the expression 'Cissbury celt', and the British Museum series has been recently

¹ On the practical side, two of His Majesty's Inspectors, Prof. Schwartz Barnes and Mr. Hugh Davies, have kindly supplied information in support of the above contention.

illustrated in *Archaeologia*, lxiii, pl. xxiv. The varieties of the type may or may not be contemporary, and their investigation is complicated by uncertainties that have now been eliminated from the Grime's Graves problem. Though the Cissbury flint-mines were carefully excavated by General Pitt-Rivers and others over forty years ago, the flints were not marked in all cases, and are now dispersed in several collections, so that it is often impossible to distinguish those found in the pits from surface-finds, protected perhaps by a few inches of soil.

As the present paper deals rather with the morphology than the chronology of flints, it will be enough to furnish a few links between the Drift and the celt



Fig. 26. Hand-axe, front and side views, Warren Hill, Suffolk. ($\frac{2}{3}$)

series of Cissbury, and to leave open the question of proximity in date. Though there are many coincidences on the two sites, there were clearly different traditions among the Sussex and Norfolk miners, and though the two groups may have been contemporary, the idea of the celt evidently reached them by different channels.

Most of the large collections in Western Europe contain specimens of St. Acheul II date, even from the classic site itself, that except for patination might be easily mistaken for Cissbury celts; and comparison would be facilitated by the use of white plaster casts, the accident of patina being thus provided against. In some cases, however, patination is more than an accident, and becomes almost a mark of origin. This is especially true of Warren Hill, between Icklingham and Mildenhall, Suffolk, which has produced many

hundreds of palaeoliths with a mottled yellow and indigo colouring, which is seen to a certain extent on a specimen (fig. 26) from that pit in the collection of Mr. G. J. Buscall Fox. Few would therefore deny its palaeolithic date, or its remarkable similarity to certain of the Cissbury celts. There is a good deal of thick crust on one face, otherwise patinated cream-colour, and the other has indigo marbling with creamy margins and fine flaking all over. The edge not shown in the illustration is even and straight, and the butt fairly sharp. L. 4.1 in.

Somewhat rougher specimens have been found in gravel at Lee-on-Solent (Mr. A. H. Bishop) and Rickmansworth, Herts. (Mr. Prescott Row). In the

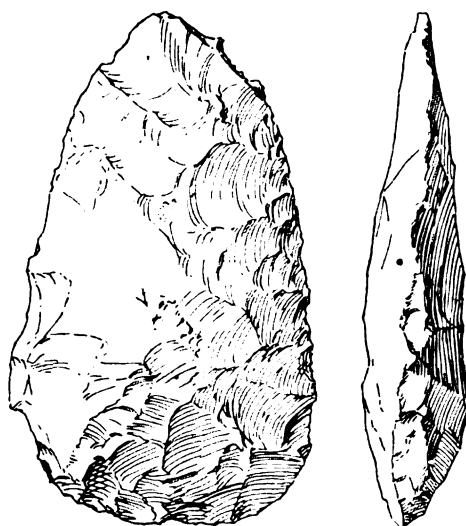


Fig. 27. Hand-axe, front and side views, Southampton. ($\frac{2}{3}$)

British Museum is one from St. Acheul, Amiens (J. S. Henslowe Collection, but exact provenance unknown), with thicker and less tapering body, much like that from Ivry, near Paris, figured in *Archaeologia*, lxiii, 133, fig. 31; and reference may be made to p. 130 of that volume for several Drift specimens of Cissbury type found in England. The list might easily be increased, but it is of more importance at present to discover a connexion between the Cissbury and Grime's Graves types of celts, if the above illustrations may be taken to establish a leading type for the latter site.

An opportune exhibit by Mr. Dale seems to supply the clue. The implement (fig. 27) measures 4 in. by 2.3 in., and has a slight asymmetry both in the side-edges and base, the more rounded angle of the latter being blunted by transverse flaking. It is covered with a thick white patina (the thickness

revealed by later chipping), and one face has some yellow staining. There is a cutting-edge all round except at the angle mentioned, and the side-edges are finely zigzag and uncurved. It was found on the site of the Ordnance Survey Office at Southampton, about 75 ft. o.d., and, being no surface-find, may have come from gravel or brick-earth. In any case, it is difficult to believe that this is removed by the whole Cave-period from the central specimen (3.9 in. by 2.1 in.) on the plate of Cissbury celts in *Archaeologia*, lxiii, pl. xxiv.

III.—*Notes on the Palaeolithic Floor near Caddington.* By WORTHINGTON
G. SMITH, Esq., F.L.S., Local Secretary for Bedfordshire.

Read 30th March 1916.

THE results of many years' search and inquiry are included in this paper, which is supplementary to the account of the Caddington palaeolithic 'floor' given in the author's *Man the Primeval Savage* (1894). The deposit has now been recognized in Hertfordshire and Bedfordshire, Caddington being formerly divided between the two counties; and the discoveries here to be described must be regarded as originally connected with the Caddington 'floor', though the three sites are now isolated hills separated by rivers that have formed, and considerably deepened, their channels since man was living in the neighbourhood during the formation of the brick-earth. The two new sites are dealt with separately, and as far as possible on similar lines, so as to facilitate comparison.

GADDESSEN ROW, HERTS.

The brick-earth pit, known as Butterfield's at Gaddesden Row (fig. 1), is a little less than 5 miles direct north-east from Berkhamsted railway station on the North-Western Railway. It is 544 ft. above Ordnance datum, 184 ft. above the river Gade at 1 mile to the south-west, and 144 ft. above the river Ver at $2\frac{1}{2}$ miles to the north-east. Gaddesden Row itself is over 2 miles long, and runs from south-east to north-west; the brickyard adjoins a Baptist chapel at the north-west end, at a turning to the south.

At 1 mile to the north-west the contour line is 600 ft., and at 2 miles the height is 628 ft. The high land at 600 ft., and above, divides the basin of the river Gade from that of the Ver, and 4 miles in the same direction a height of 759 ft. is reached. On this level at Kensworth I have found on the surface an abraded ochreous palaeolith and flakes; and the 'floor' reaches Whipsnade.

A general view of one part of the brickyard is shown in fig. 2. The workmen have dug to an implementiferous stratum or floor, at 10 ft., and a sack is shown in which the men have placed flints for my inspection. The long poles placed horizontally across the middle of the illustration bridge an excavation 45 ft. deep where chalk-with-flints is reached. The face showing the strata intact is

illustrated on the right, whilst the left side shows an old face covered with tipped-in worthless clay and stones.

A section through the valleys of the Gade and Ver, with Gaddesden Row and Caddington on the higher ground, is illustrated in fig. 3.

Sir John Evans has recorded discoveries made by himself of palaeolithic implements, prior to mine, in the valley of the Gade, in *Ancient Stone Implements of Great Britain*, ed. ii, pp. 596-7. The first implement he found was lying on the

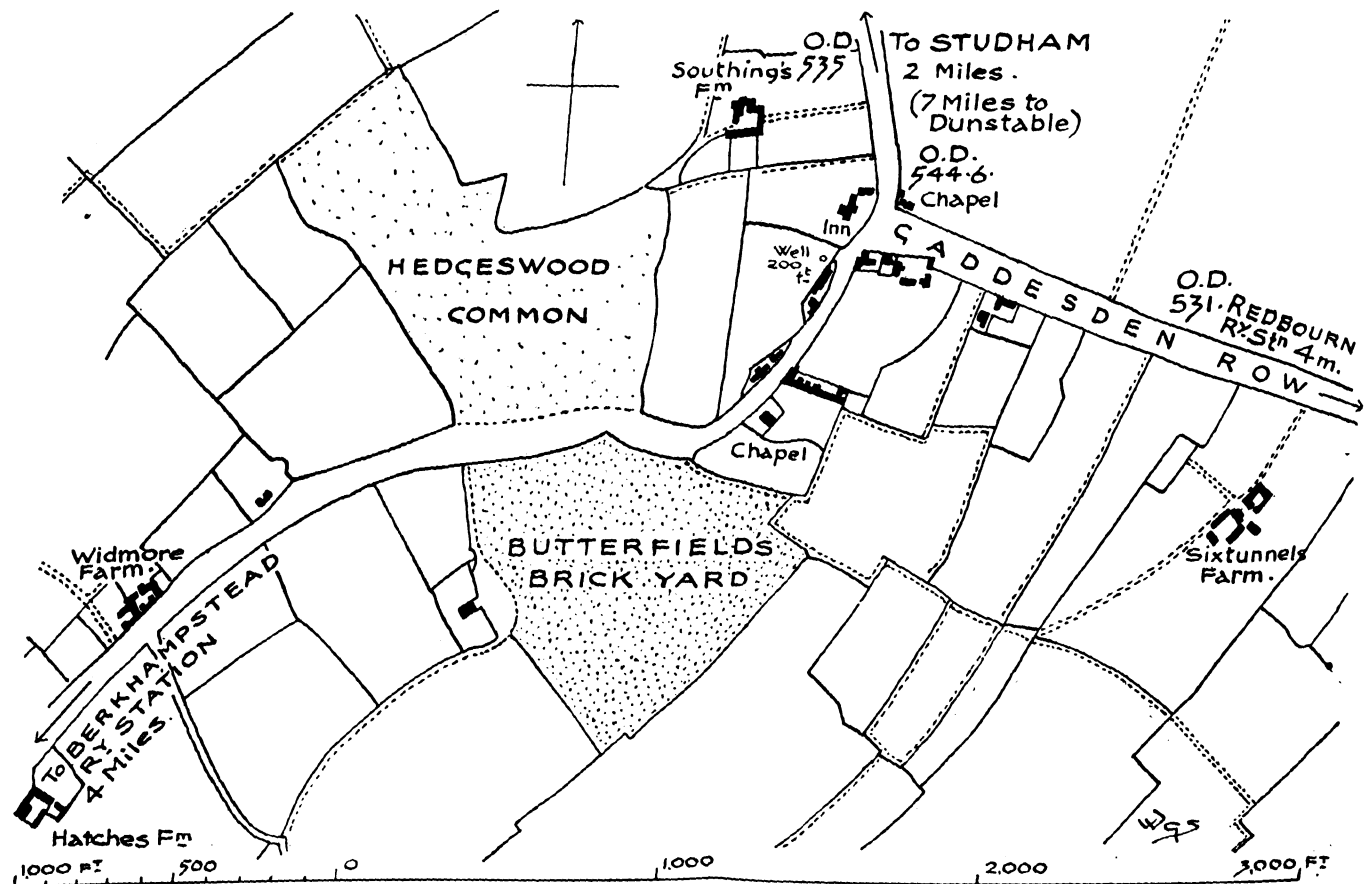


Fig. 1. Plan of Gaddesden Row, Herts., showing Butterfield's brickyard.

surface of a ploughed field at Bedmond, Abbots Langley, at about 160 ft. above the level of the river Gade. The implement was pointed, white in colour, and porcellanous, and Sir John Evans suggests its derivation from the local brick-earth. In 1892 he found a rude ovate implement 4 in. long amongst stones in a cart-rut at Bedmond Hill, and two other implements in 1868 in gravel laid on the towing-path of the Grand Junction Canal where the canal unites with the Gade about 2 miles south of Hemel Hempstead. The gravel from which these implements were derived belonged to the bottom of the valley. One of these was a grey ovate tool about 4 in. long; the other was much of the same character,

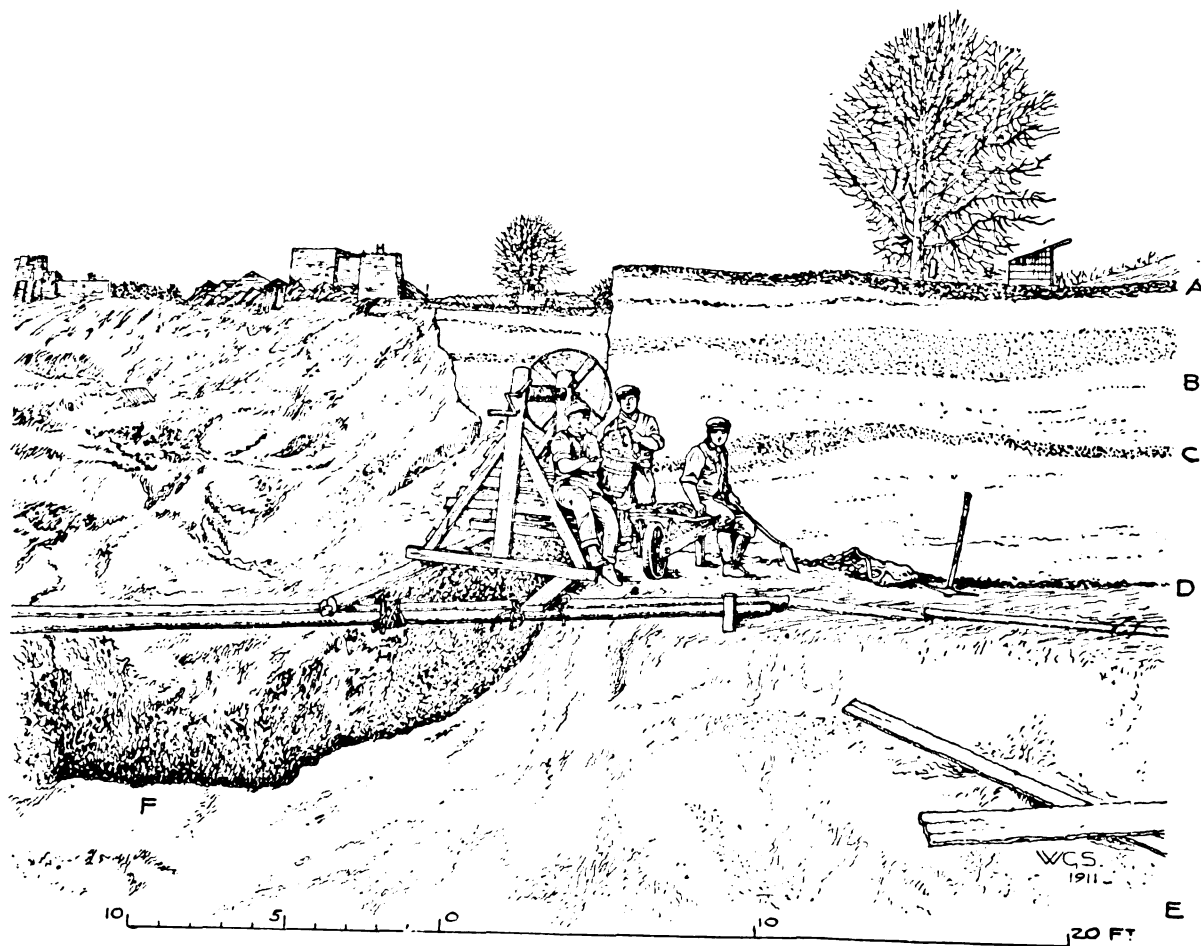


Fig. 2. Butterfield's pit, Gaddesden Row.
 A, Humus.
 B and C, Darker layers with implements.
 D, Stratum with implements.
 D-E, Floor-level exposed.
 F, Hole 45 ft. deep.

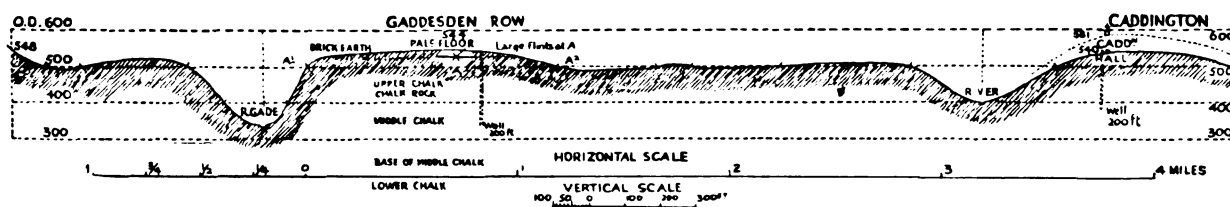


Fig. 3. Section of the Gade and Ver valleys, showing Gaddesden Row and Caddington Hall.

though flatter, with deep ochreous staining. Sir John Evans wrote that he had searched the gravels in the neighbourhood in vain for other specimens, adding that in the formation of the canal at this place, about the year 1817, an elephant's tooth was met with in the gravel within 200 yards of the spot where he found one of the implements.

It at first seems strange that after these initial discoveries Sir John Evans, living as he did so near the sites of my later extensive finds, made no further progress. He appears not to have thought of examining the higher brick-earth near where he lived, or the contorted drift on the hills. It must, however, be noted that the brick-earth in some places is of a very unpromising appearance, and in other places of a much greater age than the advent of man. Sir John was greatly astonished when I informed him of my localities and gave him some of the implements from the hill-tops. He was near the end of his life and never went into the slippery clay-pits, but was obliged to content himself by driving to the localities in a carriage, from which he alighted and examined the places from the sometimes dangerous edges of the excavations. A short time before his death he called upon me to see all that I had secured from Gaddesden Row, and expressed a strong wish to publish a description of the sites and implements. This plan I at once gladly agreed to, and his account is published in the *Quart. Jour. Geol. Soc.* for February 1908. There are two illustrations of implements—one from Gaddesden Row, the other from Leverstock Green. Since this publication many more implements have been found and new facts have come to light.

The surface of the land at and close to the pit has produced chipped celts, the upper half of a beautifully made polished celt, pieces of chipped celts, scrapers, one weighing $5\frac{1}{2}$ oz., and flakes. Many pieces of Roman pots have been met with, a piece of the rim and part of the body of a Roman amphora, a Roman denarius and blocks, and pieces of Hertfordshire conglomerate, quartzite, and many drifted pebbles and pieces of rocks, too numerous to mention.

Embedded near the surface are many blocks of Hertfordshire conglomerate, some of large size, and in both an abraded and unabraded condition. Some are more or less rounded off and in a pebble state; a few are ice-scratched. Large blocks of this conglomerate may be seen by roadsides and at the corners of cartways all over the neighbourhood. A large example is placed in front of Green-end farm, Kensworth. It was dug out near the north corner of Allcroft wood, a little more than $\frac{1}{4}$ mile to the north, and measures 5 ft. 6 in. by 3 ft. 7 in. A still larger block, nearer Gaddesden Row, still lies buried in the earth in a field between Studham and Deadmansea wood, and measures 10 ft. across.

Hertfordshire conglomerate is only met with *in situ* in two places in Herts., viz. at Radlett and Bernards Heath.

A rude palaeolithic implement, made of Hertfordshire conglomerate, found by me in the valley of the Ver at Markyate Street, North Herts., is now in the British Museum. It weighs 1 lb. 6¼ oz., and is made from a large and heavy bulbed flake. It is illustrated in the *Victoria History of Bedfordshire*, p. 158, fig. 37. Flakes of this material rarely occur; one is illustrated in that volume, fig. 38.

The brick-earth pit is sometimes dug to a depth of 45 ft., when a stratum of chalk and large flints is reached at 500 o.d. The flints have not been dug through, but chalk is sometimes drawn up from a well 200 ft. deep a little to the north of the brickyard, marked on the map (fig. 1).

Above the basal stratum of flints there is about 40 ft. of relaid Eocene clay, horizontally but somewhat irregularly stratified. Above this is some 4 ft. of a contorted drift, surmounted by about 1 ft. of humus. See figs. 4, 5, and 6.

The brick-earth is of Eocene or Tertiary origin, but none of it is in its original position. All has been relaid. It has been washed into place in successive periods since Eocene times, the periods possibly not far apart from each other. The deposit probably came from some place in the neighbourhood, possibly not far off, where the clay existed in its original position as laid down in Eocene times. This fact is of the greatest importance, as a casual observer, judging from blocks of Hertfordshire conglomerate, grey quartzite, and other rocks and pebbles, might come to the conclusion that the clay was unmoved Eocene, and not likely to be productive of human work. I think this must have been the reason why Sir John Evans never closely studied these clay-pits. At any rate it represents my own early attitude of doubt towards these excavations. I was led to a close examination by a Caddington workman, who temporarily left a Caddington pit to work at Gaddesden Row. This man knew implements and flakes very well, and began to find implements at his new quarters. The tools he brought on to me for disposal, and I soon saw my mistake as to the nature and age of the Gaddesden Row and Leverstock Green clay.

The contorted drift, where marked on the sections (figs. 4, 5, and 6), is of a darker colour than the bulk of the clay, and contains, as is always the case in implementiferous districts, the sweepings of the old land surface, mixed with stones, some large, and probably ice-borne, from more distant places.

The brick-earth is stratified in practically horizontal layers, which often undulate slightly, and are rarely somewhat duplicated. There are seven or eight strata with stones, implements, and flakes in each. No implements are found lower down than 35 ft., so that when man first appeared at this place there was about 10 ft. of brick-earth resting on chalk and flints. The lowest stratum

SECTIONS SHOWING PALAEOOLITHIC DEPOSITS AT GADDESSEN ROW, HERTS.

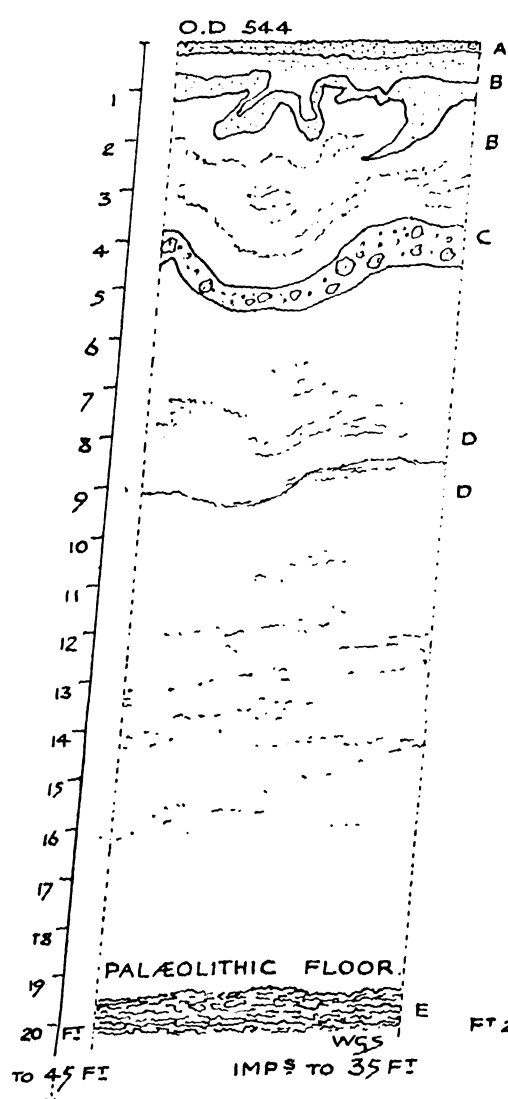


Fig. 4.

- A, Humus.
 B, Whitish clay.
 C, Buff or brown clay, with brown abraded implements.
 D, Whitish-buff clay.
 E, Palaeolithic floor, darker buff colour.
 At 45 ft. a thick layer of large flints: chalk not reached.

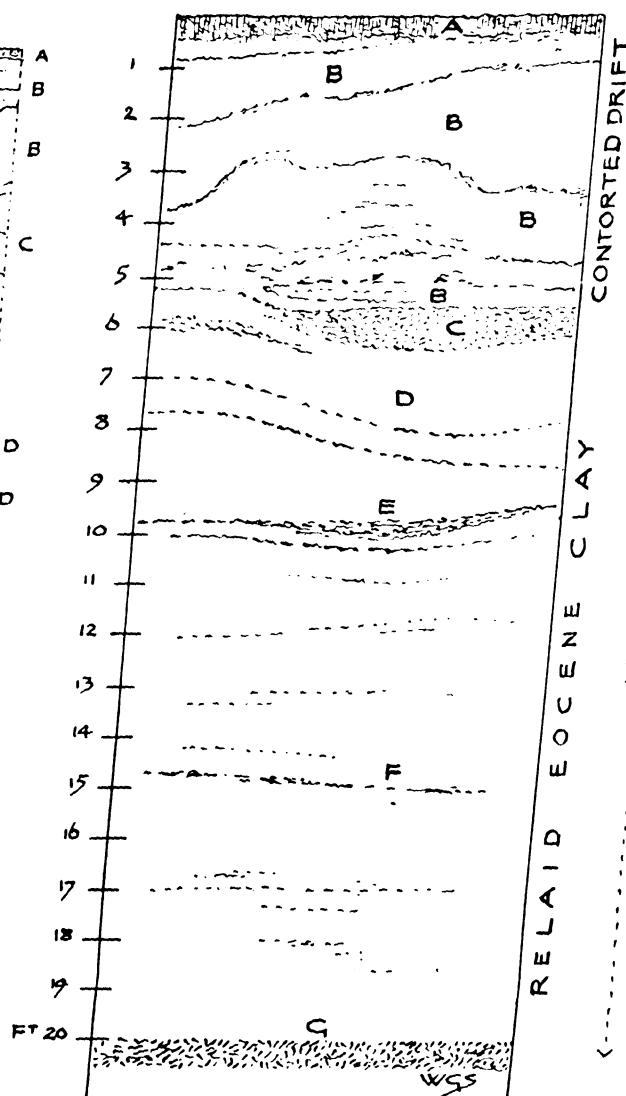


Fig. 5.

- A, Humus.
 B, Contorted drift, with implements.
 C, Darker clay, with implements slightly stained and sometimes slightly abraded.
 D, and below, Relaid Eocene clay.
 E and F, Strata, with implements.
 G, Palaeolithic floor, with replaceable flakes.

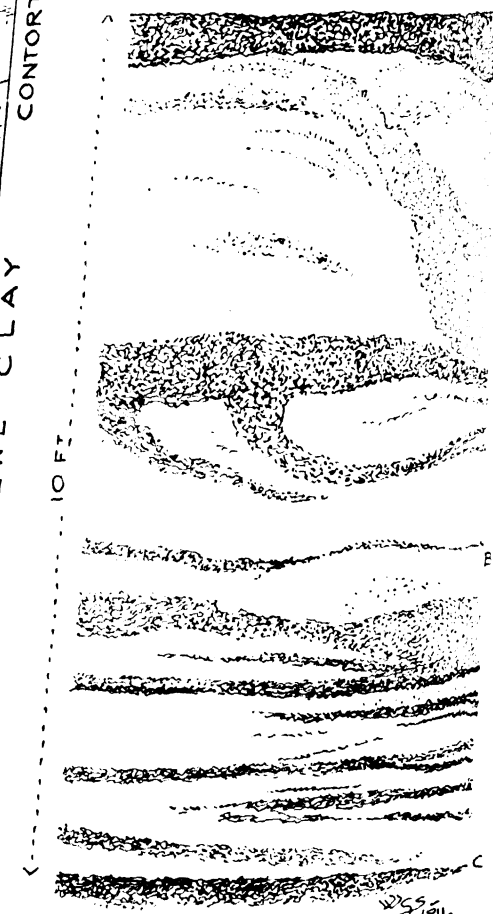


Fig. 6.

- A, Humus.
 B, Contorted drift.
 C, Water-laid palaeolithic stratum.
 B and C contain palaeoliths of the same age.

at 35 ft. has produced but few implements, and judging by appearances the place became gradually covered to a depth of about 10 ft. with water-laid brick-earth. There is no trace of rushing water throughout. A second collection of implements occurs in a stratum 30 ft. from the surface, as if the first set of men belonging to the 35 ft. layer had left the place, but returned after the floodings had ceased. This repetition goes on until 20 ft. from the surface is reached, where there occurs a true palaeolithic floor with many implements and flakes, some of the latter obviously struck from a single block, as flakes have been replaced by myself. Here with the implements are a few large and heavy blocks of quartzite and Hertfordshire conglomerate which could only have been moved by ice. A few have exhibited scratches and polishing. I have kept one block of quartzite, weighing 9 lb. 3 oz., which seems to have been struck by human hands from a larger block, and I once saw a large block so heavy that I could not raise it from the ground. Large flakes had apparently been struck from it. I asked the men to bring it to me in one of their brick-carts when they were coming to Dunstable with bricks: they promised to do this, but I learned later that one of the men pushed it into a deep excavation, probably afraid of adding its weight to a cart-load of bricks. Many broken-up and flaked pieces of quartzite have been found, often in isolated groups. Some of the quartzite flakes exhibit retouching, but no quartzite implement has been found at Gaddesden Row. Both Hertfordshire conglomerate and quartzite, although they vary in hardness, are generally the most intractable of stones for breaking up, and an accidental heavy blow from a pick will break the pick. I lately had a block of quartzite so hard that it defied all the well-known methods of flaking or breaking. I could not strike off a flake large or small, and asked an extra strong man armed with a heavy hammer, chisel, and a large granite pebble to try his hand; after many failures he at length managed to strike off a flake. After experiences of this kind it seems all the more marvellous that palaeolithic men could make beautifully formed implements from such an intractable rock. A specimen in this material from Caddington is here illustrated (fig. 7), and agrees with the quartzite dug at Hartshill, Nuneaton, NE. Warwickshire.

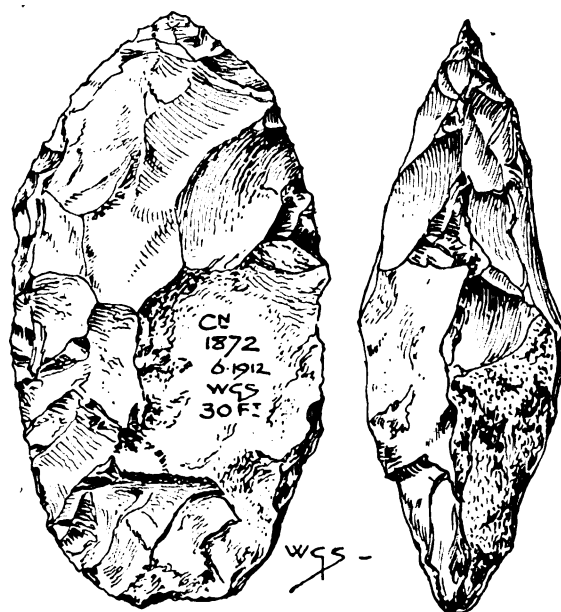


Fig. 7. Front and side views of quartzite implement found 30 ft. deep at Caddington. ($\frac{2}{3}$)

I look upon all the lower strata of brick-earth, except perhaps the basal ten feet, as precursors of the coming of the contorted drift. The strata become more and more stony as they ascend, till the culmination is reached at the horizontal palaeolithic floor at 20 ft. from the surface. The surface contained an abundance of large flints derived from adjoining lower places where the chalk and flints occurred on the surface, such as the position where the cross is placed on the horizontal line near the middle of fig. 3. There are still such places existing, as at Cheverell's Green (538 o.d.), where, during the recent drainage of the place into the valley of the Ver, enormous quantities of large flints were excavated from close to the surface.

At last the stratum of the palaeolithic floor became covered with water and brick-earth like the other strata below, but with this difference, the stratification became more and more undulatory till about 6 ft. or more below the present surface. There are streaks of darker coloured clay, seen on the exposed faces, as at B, E, fig. 5, and B, B, c, fig. 6; these contain faintly brownish, somewhat abraded implements. The streaks vary in colour from light to darker brownish. A few implements are blackish or purplish, others are variegated. This difference in colour is caused by the differently coloured environment of clay. All the implements are coloured within black, blackish, or purplish slate-colour.

The capping deposit is a contorted drift, often not more than 3 ft. deep, and at times somewhat feebly developed. In some places, however, it is well developed, as at A, B, c, fig. 4. It contains brownish or faintly liver-coloured implements, mostly somewhat abraded. These implements are probably not much older than the implements which occur below; they have all been swept from higher positions in the neighbourhood, now washed away.

There is no method of calculating how long the intervals were between the deposits; the pauses may have lasted a few or very many years.

The pits are liable to flooding. In March 1904, owing to heavy and continuous winter rain, the clay-pit became filled with water. Nothing had been known like it before, and it took two months for the water to drain away. Similar flooding has been known at Caddington. I have seen the pits full of water, which has covered the roads; and the lower places in some lanes have been full of almost impassable pools.

No bones or teeth have been found in the brick-earth.

The Gaddesden Row implements are as a rule ovate or pointed ovate in outline, thicker at the middle and base, and with cutting-edges above. Implements with a cutting-edge all round are less common. Sharply pointed implements are very rare; in fact only one very sharp example has been found, and that was unfortunately lost again owing to a woman giving it to a child to

play with. Pointed implements occur at Caddington and Round Green, but they are rare at both places.

Nearly all the implements are ivory-colour or white, others are very faintly ochreous, rarely truly ochreous or brown, and a few dull purplish.

They are as a rule sharp-edged or very slightly abraded, and do not vary in shape from top to bottom of the pit.

- Fig. 8. A somewhat thick, pointed ovate implement, with an acute cutting-edge above; both faces are equally convex, although one edge is blunter than the other. Size, 6×3 in. Weight, $14\frac{1}{2}$ oz.
- Fig. 9. An ovate implement, the section below showing, more definitely than the last, that great care was exercised in making one edge and the upper part specially acute. Size, $6\frac{3}{8} \times 3\frac{1}{8}$ in. Colour, faintly ochreous white and speckled. Weight, 1 lb. $1\frac{1}{2}$ oz.
- Fig. 10. An ovate implement with acute edges above. Size, $5\frac{3}{4} \times 3\frac{1}{8}$ in. Colour, whitish buff. Weight, $15\frac{1}{2}$ oz. I found this sticking out from the side of the pit, at a depth of 15 ft.
- Fig. 11. An ovate implement, peculiar from its being of the same thickness throughout; the upper part seems to have been worn away by use or accident and afterwards possibly rechipped. Size, $4\frac{1}{8} \times 2\frac{7}{8}$ in. Colour, brown. Weight, $8\frac{1}{4}$ oz. The implement is slightly scratched, showing that it came from the contorted drift.
- Fig. 12. A somewhat thin, pointed ovate implement, with a strongly twisted edge; the edge is continued all round the implement. Size, $5\frac{1}{2} \times 3\frac{1}{8}$ in. Colour, white. Weight, 10 oz.
- Fig. 13. A small, almost circular implement; it has a cutting-edge all round. Size, $2\frac{1}{2} \times 2\frac{1}{4}$ in. Colour, faintly ochreous white. Weight, $2\frac{1}{8}$ oz.
- Fig. 14. An almost circular implement, with a cutting-edge all round. Size, $2\frac{1}{4} \times 1\frac{7}{8}$ in. Colour, white. Weight, $1\frac{3}{20}$ oz. One of the smallest implements that the pit has produced.
- Fig. 15. A hump-backed or shoe-shaped implement, of rude ovate plan, with the hump unusually well marked; the basal part is left unworked. Size, 4×3 in. Colour, faintly ochreous, crust white. Weight, $12\frac{3}{4}$ oz.
- Fig. 16. A wedge-shaped chopper, almost quadrangular in outline, with an upper cutting-edge. Size, $3\frac{1}{8} \times 2\frac{5}{8}$ in. Weight, $6\frac{1}{4}$ oz.
- Fig. 17. A rude, but almost perfect disc, made from a tabular piece of flint, apparently intended as a missile. Size, $2\frac{3}{4} \times 2\frac{1}{2}$ in. Colour, yellow-ochreous; crust, biscuit. Weight, $4\frac{1}{2}$ oz.
- Fig. 18. A small hand-chopper, useful for cracking nuts, for breaking and pounding small bones, or for use as a wedge; it is a small example of a well-known form. Size, $3 \times 2\frac{1}{2}$ in. Colour, yellow.

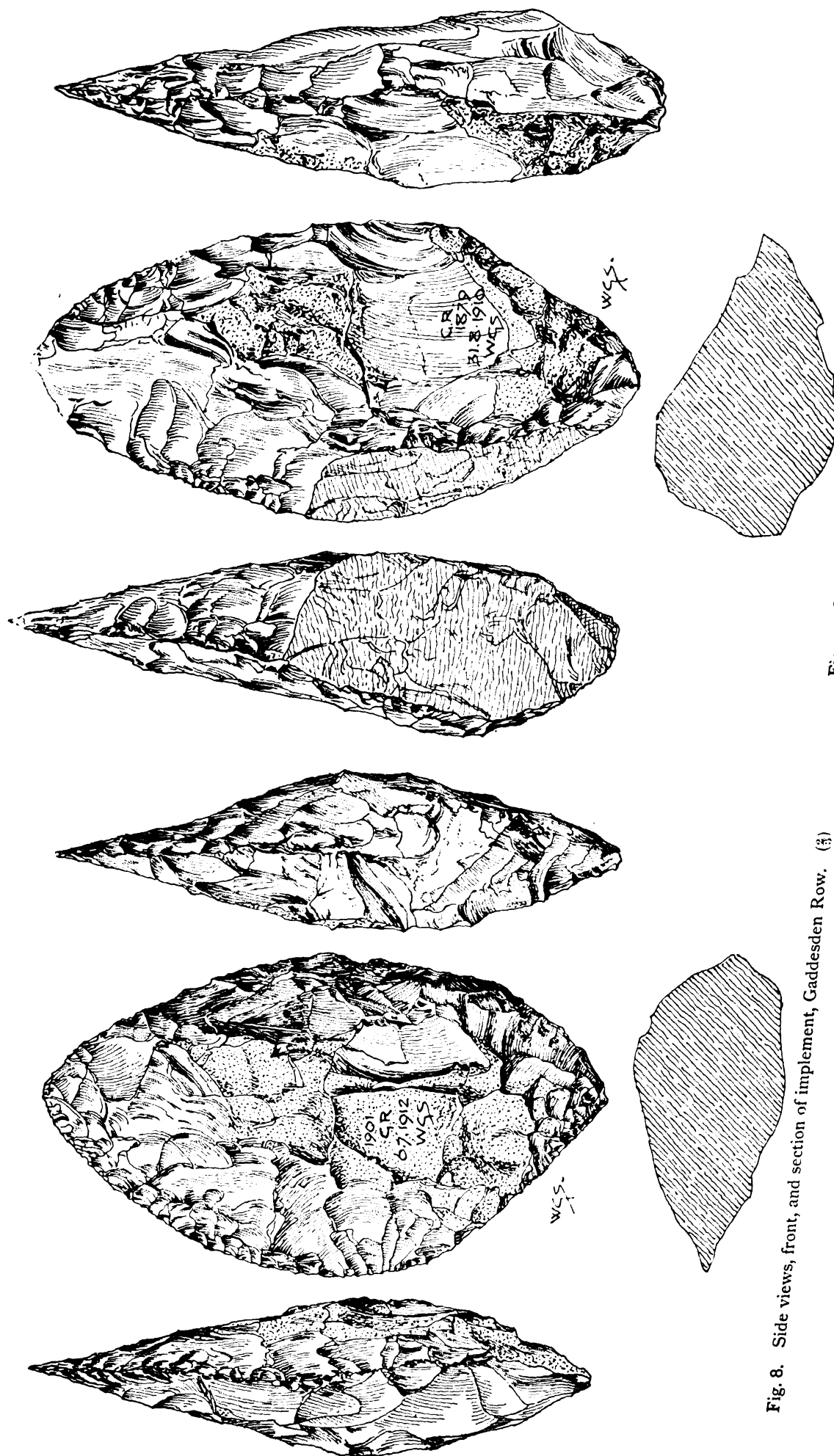


Fig. 8. Side views, front, and section of implement, Gaddesden Row. (3)

Fig. 9. Side views, front, and section of implement, Gaddesden Row. (3)

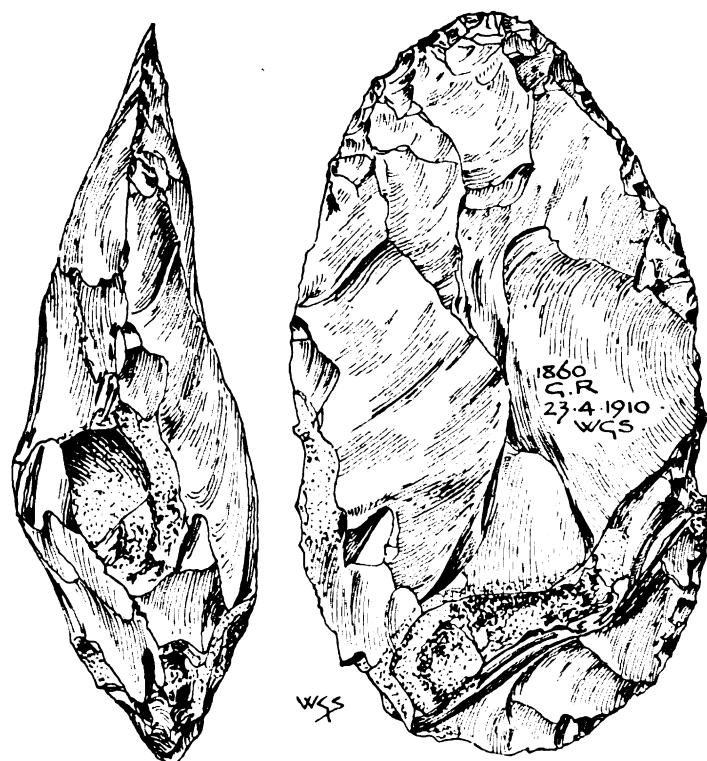


Fig. 10. Side and front views of implement, Gaddesden Row. (3)

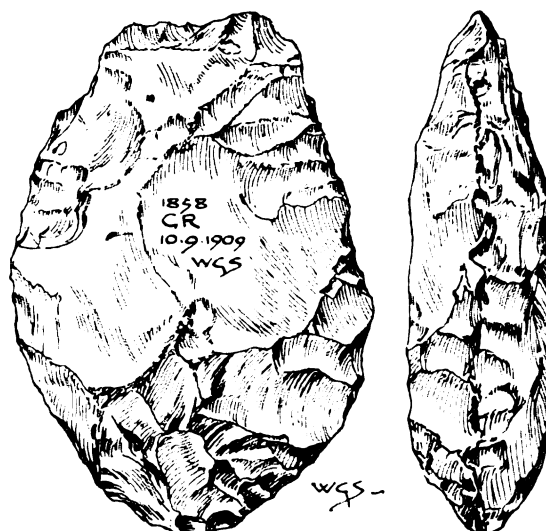


Fig. 11. Front and side views of implement from contorted drift, Gaddesden Row. (3)

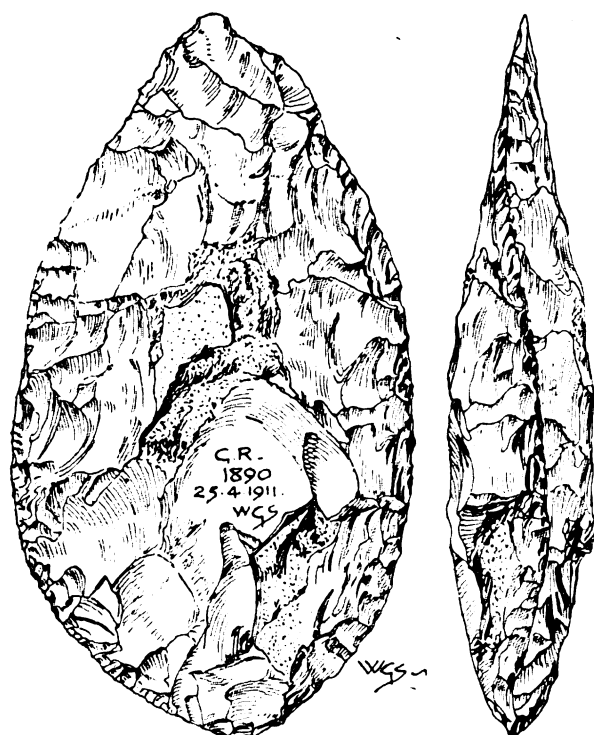


Fig. 12. Front and side views of twisted implement, Gaddesden Row. (3)

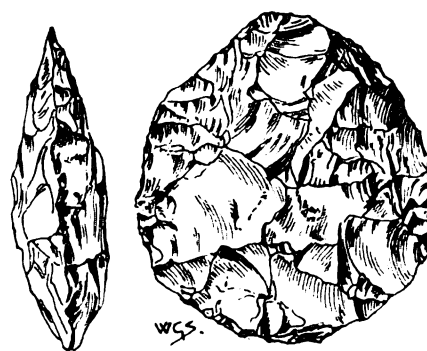


Fig. 13. Discoidal implement, side and front views. Gaddesden Row. (3)

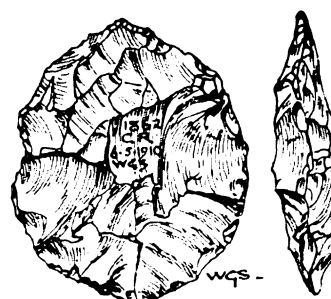


Fig. 14. Discoidal implement, front and side views, Gaddesden Row. (3)

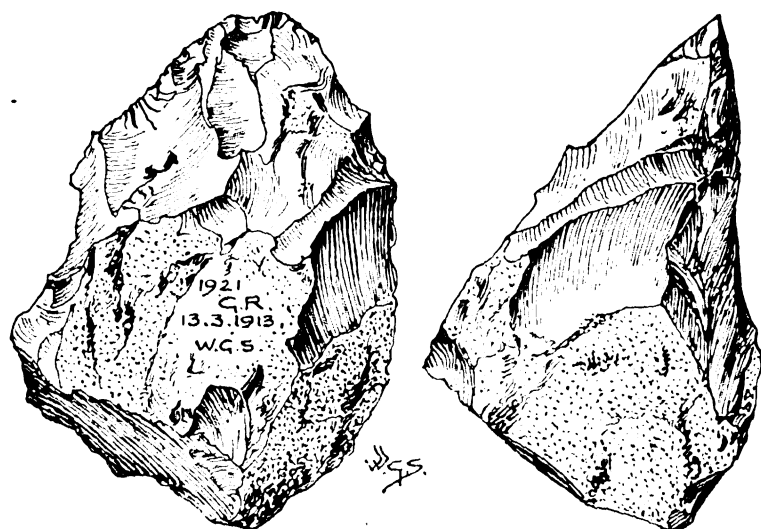


Fig. 15. Implement with conical face, front and side views, Gaddesden Row. (3)

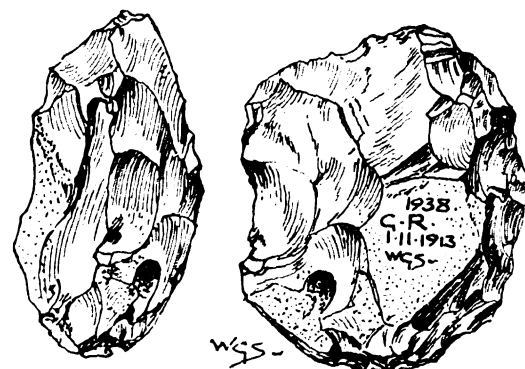


Fig. 17. Discoidal implement, side and front views, Gaddesden Row. (3)

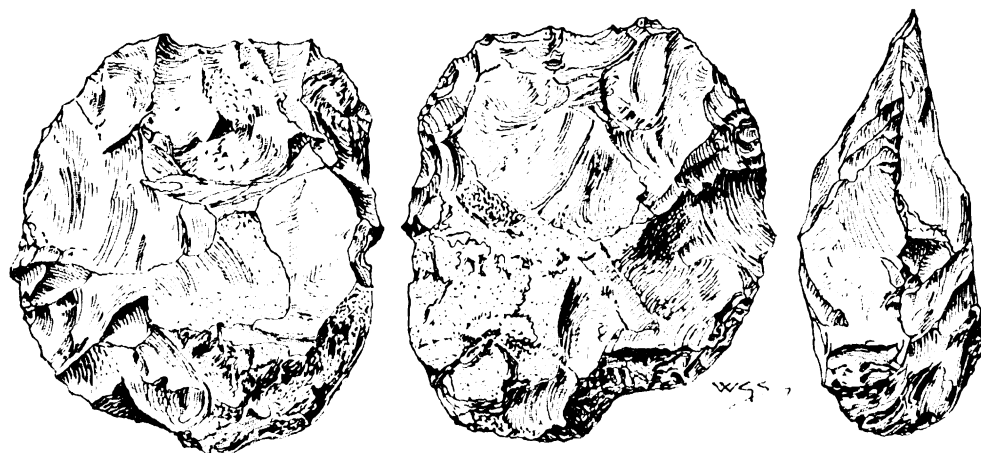


Fig. 16. Square-ended implement, front, back, and side views, Gaddesden Row. (3)

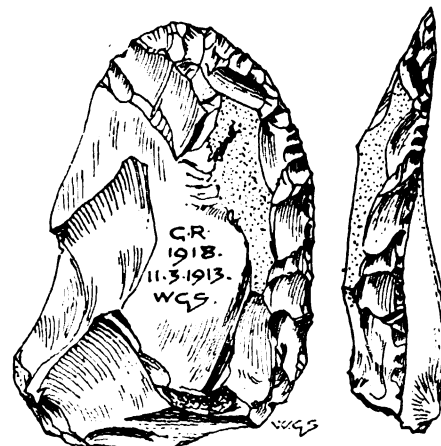


Fig. 19. Front and side views of worked flake, Gaddesden Row. (3)

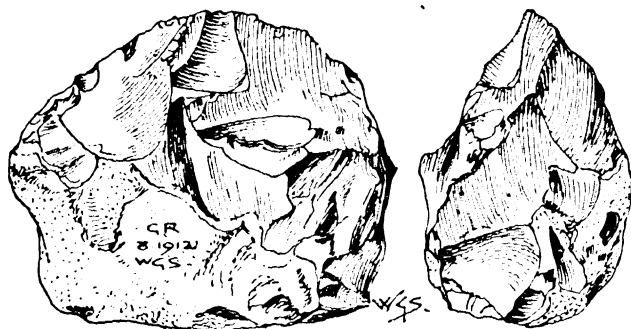


Fig. 18. Front and side views of chopper, Gaddesden Row. (3)

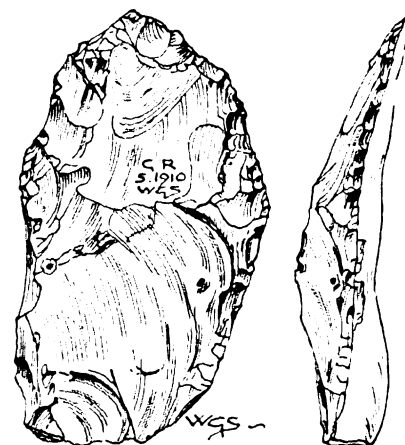


Fig. 20. Worked flake, front and side views, Gaddesden Row. (3)

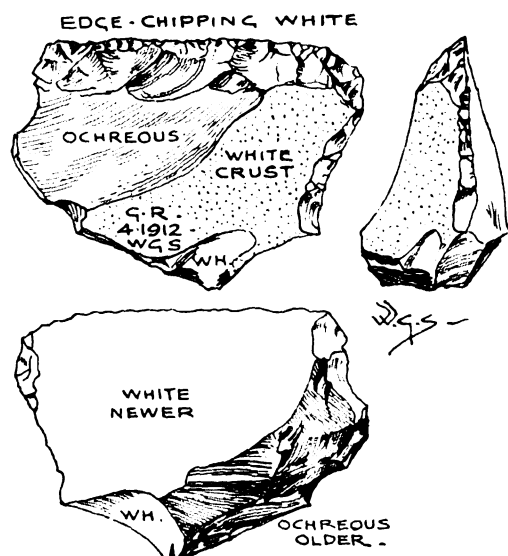


Fig. 21. Front, back, and side views of worked flake with double patina, Gaddesden Row. (3/4)



Fig. 22. End-scraper on blade, front and side views, Gaddesden Row. (3/4)



Fig. 23. Flake with hinge fracture, side and front views, Gaddesden Row. (3/4)

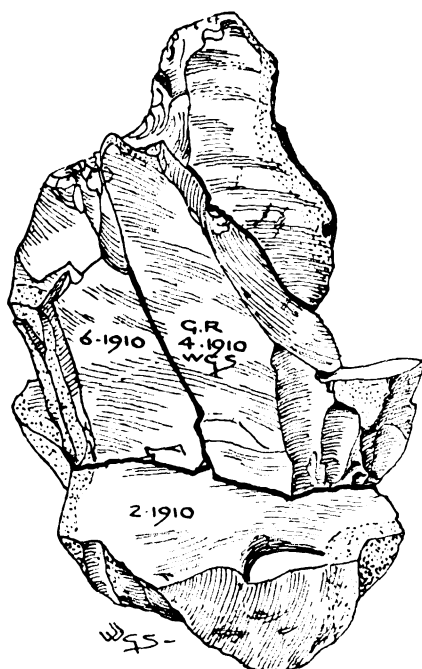


Fig. 24. Three flakes refitted, Gaddesden Row. (3/4)

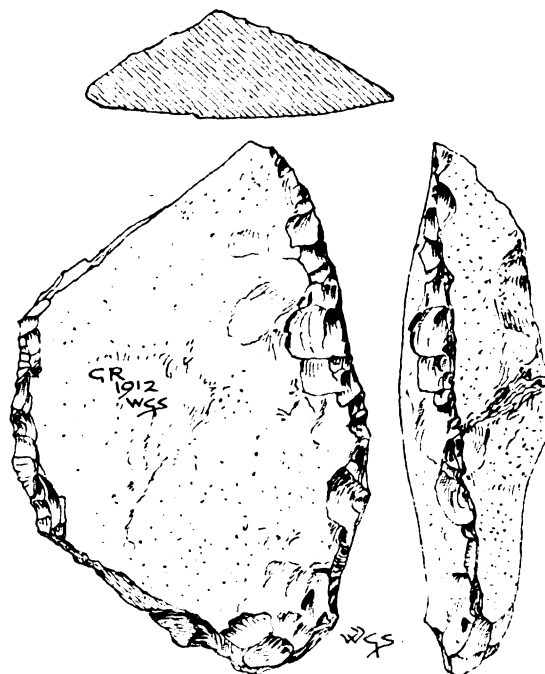


Fig. 25. Quartzite scraper, front and side views, and section, Gaddesden Row. (3/4)

- Fig. 19. A knife-flake, beautifully chipped along one edge and at top; the reverse side is plain. Size, $3\frac{1}{2} \times 2$ in. Colour, somewhat buff-ivory, crust white, ferruginous stain.
- Fig. 20. A fine example of thin pointed knife-flake, chipped all over on one side; the reverse plain. Size, $3\frac{1}{4} \times 2$ in. Eleven knife-flakes have been found at Gaddesden Row.
- Fig. 21. A side-scraper with a straight edge. It is made from a piece of flaked ochreous flint. On the front is a piece of ochreous surface with the edge-chipping and crust white; the reverse shows older ochreous chipping from which a flake has been removed. Size, $2\frac{3}{4} \times 1\frac{7}{8}$ in.
- Fig. 22. A typical long blade-scraper. Size, $2\frac{7}{8} \times 1\frac{1}{4}$ in.
- Fig. 23. A well-made long flake with hinge-fracture above. Size, $4\frac{1}{8} \times 1\frac{3}{4}$ in.
- Fig. 24. A group of three replaced flakes found in February, April, and June 1910. Size, $5\frac{1}{4} \times 3\frac{1}{4}$ in.
- Fig. 25. A flake of quartzite with secondary chipping on the flatter side. Size, $4\frac{1}{4} \times 2\frac{3}{8}$ in.

ROUND GREEN, LUTON, SOUTH BEDS.

Round Green is somewhat less than a mile direct north-east from the Midland and Great Northern Railway stations at Luton. Its level is 530 ft. above the Ordnance datum, and 132 ft. above the river Lea at Luton (six-inch Ordnance map, Bedfordshire, xxx, S.W.).

A map of the district is here shown (fig. 26). The small brickyard is situated in a considerable depression on the summit of the hill. A complete series of photographs of all aspects of the pit was taken.

The drainage on the east side reaches the Lea by Nether Crawley farm and the Luton Hoo lake, where the river Lea changes from a sluggish little brook into a large and long artificial lake. On the west the drainage descends somewhat sharply into the Lea valley. On the south the descent into the valley is also steep; nearly the whole town of Luton may be seen at the bottom of the valley. In a south-westerly direction, Caddington is seen on a hill-top on the other side of the great valley two and a half miles away, with Luton at the lowest part. An illustration is here given (fig. 27) of a section through the valley, more than 200 ft. in depth, between Round Green and Caddington; both places are practically on the same level, and both are on Upper Chalk with flints, capped by brick-earth and Tertiaries.

When man first appeared at what is now Round Green and Caddington, this large valley was only slightly excavated. The valley probably existed in a shallow initial condition for a vast period of time. Glaciers and torrential

floodings have lowered it to its present level. When man first arrived there must have been an immense spread of swampy ground at about the present 500 ft. level between where Round Green and Caddington now stand. The great bulk of the material which once filled the valley has been swept into the Lea and Thames since man departed or was destroyed. By glancing at the great valley which now exists between Round Green and Caddington, with this

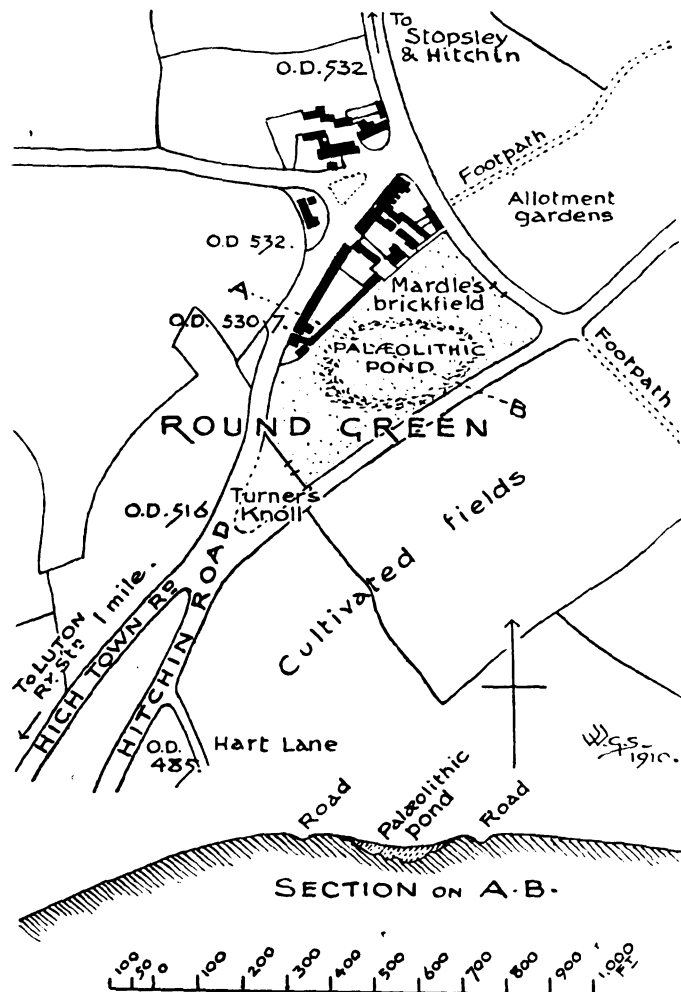


Fig. 26. Plan and section of Round Green, near Luton, Beds.

fact in mind, a good idea of the enormous period of time that has elapsed since palaeolithic man once lived in this district may be obtained.

The nature of the surface soil at Round Green is best seen in exposed sections by roadsides when the making of new roads is going on. It is seen in the shallow diggings for the foundations of new houses, and of course in all old and new clay-pits. It cannot be well seen in ploughed or cultivated fields.

The sections show humus or dark mould from 6 in. to 2 ft. deep; amongst these are broken up flints from clay-with-flints and chalk-with-flints, Tertiary pebbles, pieces of quartz, iron sandstone, Lydian stone, and many pieces of Hertfordshire conglomerate. Neolithic implements and flakes occur as well as broken Roman pottery and Roman coins.

In some places chalk-with-flints and clay-with-flints appear *in situ* on the surface. The brick-earth represents washings of the red clay-with-flints, and the colour is derived from the iron sandstone in the Tertiaries. Sometimes there are extensive washings of the chalk.

The older deposits close to Round Green are shown in fig. 28, and the palaeolithic brick-earth in fig. 27.

At the highest part of Round Green there is, or rather was, a very obvious swampy depression of the ground marked 'Palaeolithic Pond' on the map

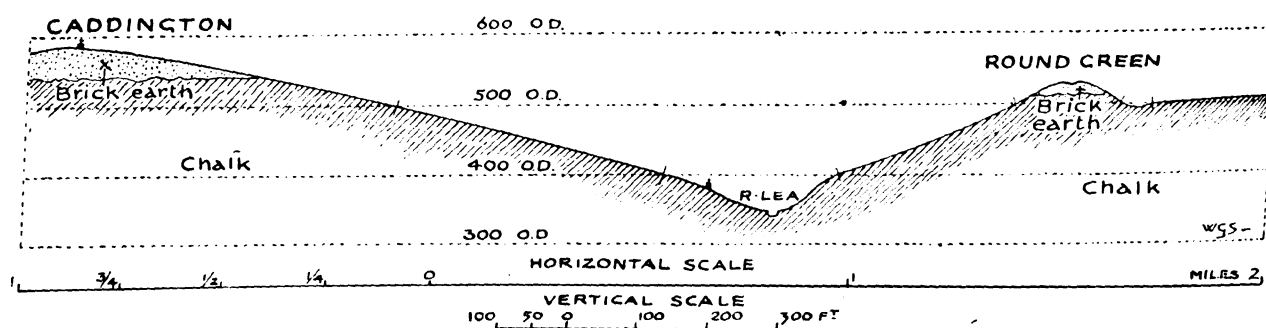


Fig. 27. Section showing the Lea valley between Caddington and Round Green.

(fig. 26). The depression was roughly oval in shape, about 350 ft. long and 200 ft. broad, and was clearly visible outside the brickyard at Turner's Knoll.

No one would suspect the presence of brick-earth within the old boundary of this waste patch, as the outside was chalk-with-flints, red clay-with-flints, almost colourless, translucent sand, and Tertiaries. The presence of brick-earth was revealed by accident to a master brickmaker. A small excavation or drain of some sort was being dug from the inside to the outside of this No-man's-land, and in the little trench the brickmaker saw, to his surprise, water charged with brick-earth trickling along. He had a few test holes dug which revealed the deposit of brick-earth and ultimately brought to light the palaeolithic floor. This discovery led to a lease of the ground being taken and the establishment of the brickyard. The pit was dug to a depth of 20 ft., and the water-logging shows a modern return to the palaeolithic pond state.

Toward the extremity of the excavations, at the south, the clay proved to be too stony for bricks to be easily made from it. A raking machine with a circular trough-roller and pony were then introduced for removing the stones.

During this process many bulbed flakes and bruised and battered pieces of flint were produced, hardly to be distinguished from hand-made work.

The geology of the restricted area of the Round Green brickyard appears to be as follows: the base is Upper Chalk (A, fig. 28) capped by a layer of flints, large and small. This layer at Turner's Knoll on the south side of the brickyard is close to the surface, with in some places unusually large flints. I have seen flints at this position so large that they could not be put into the pails used for drawing up the clay, or even conveniently moved or turned over by one man; such stones were roped round and drawn up by the windlass. Many of the flints were seen to be split whilst still *in situ*. All were more or

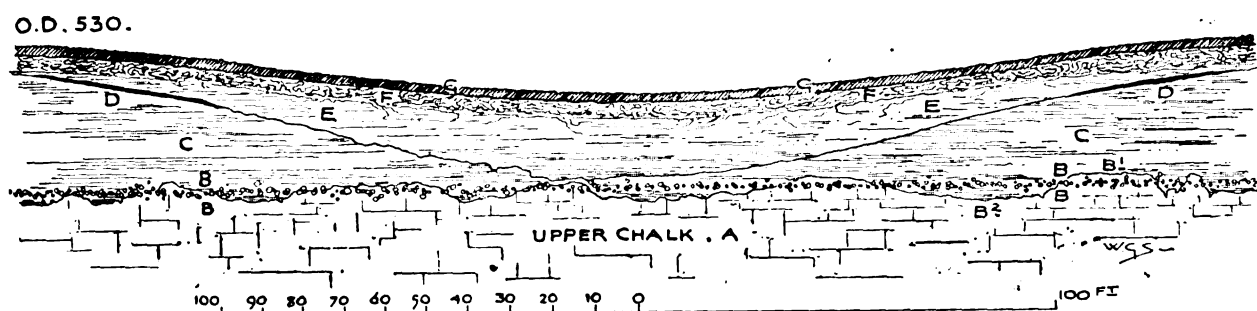


Fig. 28. Section through pond and palaeolithic floor at Round Green.

A, Upper Chalk.
B, Layers of flints.
B¹, Clay-with-flints.
B², Chalk-with-flints.
c, Stratified brick-earth.

D, Palaeolithic floor.
E, Washings of brick-earth.
F, Contorted drift.
G, Humus.

less covered with black oxide of manganese. At a very short distance to the north-east the chalk appears at the surface. There are two small chalk-pits to the right and left of the lane which runs from Round Green to Ramridge End. The field south of the western pit is seen to be white with chalk when it is free from crops in the winter; whilst the field on the other side of the lane is red with clay. The layer of flints is shown at B on the section. It is clay-with-flints at B¹, whilst closely adjoining at B² it becomes once more chalk-with-flints. Above the undisturbed flint layer there is 12 ft. of stratified brick-earth, c, and the palaeolithic floor is superimposed at D. The palaeolithic floor is covered by washings of brick-earth at E. This deposit must have been very gently laid down, as none of the palaeolithic implements and flakes were disturbed in the slightest degree; this is proved by the fact that some of the flakes were capable of replacement. At F a contorted drift occurs, and at G humus, thinly scattered over with pebbles and stones derived either from boulder clay or Tertiary beds. In the contorted drift, ochreous palaeolithic implements occur, and sometimes

non-ochreous as swept from the floor, together with blocks of chalk and other materials swept in past times from some old land surface adjoining. The contorted drift is but poorly represented in the Round Green brickyard, but near by are drifted deposits, containing large rolled blocks of Hertfordshire Tertiary conglomerate, quartzite, iron sandstone, various grits, Lydian stone, quartz and quartz sand, together with many other drifted stones foreign to the locality. There are also traces of drifted highly coloured clays and stones belonging to the Woolwich and Reading beds, and of whitish drifted stony boulder clay.

The evidence appears to show that man came after the great glacial period, for no evidence has reached me that he was here before or during the deposition of the boulder clay of the district. The country must have resembled what it is now, with the one great exception of the valley of the Lea. Chalk and chalk-with-flints, Tertiaries, clay-with-flints, and areas with boulder clay were all present. The land was undulating with no deep valleys anywhere; water was plentiful in the form of brooks, ponds, and swampy places.

At length this genial climate gave way to severe conditions; and floods, perhaps due to melting snows, brought down a clayey loam from slightly higher ground to the north. This sedimentary deposit covered up the palaeolithic floor, so that the worked and unworked flints retained their original positions, only to be disturbed in our own time. The pond on the site of Round Green was filled to a depth of 14 ft. with loam, derived probably from the red clay-with-flints and the chalk. Then came another change for the worse in the climate, and ice action is proved by the contorted drift that was thrust into and over the brick-earth. The soil was frozen, and any slight thaw would produce considerable disturbance of the loosened surface, where there was any slope. In the process many of the transported stones were battered and abraded, flakes were detached by blows or the mere action of frost, and scratches were produced on the surface even of the hardest flint. There is in my possession a drawing of a mass of stones transported by ice to Caddington. It measured 12 ft. in length and 6 ft. in depth, but the bottom was not reached; it lay edgewise in the brick-earth as a travelled boulder.

To summarize, man first appeared in the neighbourhood of Round Green at the close of the great glacial period. There is no evidence of his existence here before or during that period. He lived here for an immensely long period of time in a genial climate, but was overtaken, enveloped, and killed during the deposition of the contorted drift.

This drift completely covered over and effectually preserved everything below, just as stalagmite has preserved antiquities in caves. In some local cases it scooped out hollows 40 ft. deep which afterwards became filled with clay.

Some observers of great ability and long experience have thought that some of the men possibly survived in Britain or on the Continent, or that some of the Continental survivors returned to Britain and continued making stone implements on the new dried surface. They point to implements of palaeolithic shape now found in or near the surface. That such implements do occur is certain, and the Round Green neighbourhood is no exception. Some examples cannot be classed as truly palaeolithic or neolithic. These specimens have received many names, often based on place-names abroad. Both forms of implements appear—ovate, rounded ovate or pointed ovate, and elongated. The few that I have seen at Round Green, and a few miles round, are small in size, but well made. Some examples from a stratum a little distance up to 4 ft. below the surface are as fresh in appearance as if just made; they include 'horseshoe' scrapers.

I have recorded¹ the finding, in 1886, of animal bones, antlers of *Cervus elaphus*, and sharp palaeolithic flakes, found in a now long disused brick-earth pit at Mixies hill, one quarter of a mile north of Round Green, at a height above Ordnance datum of about 520 ft., or 10 ft. lower than the Round Green surface. The pit was about 22 ft. deep, and one productive stratum was about 10 ft. or 12 ft. below the surface. Other bones and antlers had been found in the pit before I knew the brickyard, but I could not recover them, and immediately after the discovery the pit was closed and abandoned. I have kept one piece of bone; the others, which were friable and dark-brown in colour, together with flakes, I sent on to Sir John Evans. In later visits I dug out several flakes from this stratum. Soon after this find the builder of the kiln informed me that the base of the pit at 22 ft. had produced many more bones, and that some of these had been taken away by the workmen. At this time the men had left the pit and I could not trace them.

In 1905, nine years after the pit closed, I questioned a digger, Joseph Ford by name, in another pit, at Ramridge End, a quarter of a mile east of Mixies hill, a pit in which I had found one or two palaeolithic implements and a few flakes. He had found none at Ramridge End, but had helped to dig out a lot in the Mixies hill pit, just mentioned, some years before, at a depth of 22 ft. Near these bones, but not with them, he stated that the diggers came across the bones of a human being extended at full length on its right side, and with all the bones in place, and the head, which was somewhat flattened, to the south-west. He measured the skeleton, which he said was 5 ft. 6 in. long. The bones were all dark-brown in colour and very friable, agreeing with the colour of the bones found by myself. The skull fell to pieces on being touched. The great

¹ *Man the Primeval Savage* (1894), p. 167.

depth at which the bones were found preclude any idea of a burial. I published an account of this discovery in *Man*, 1906, p. 10. Later on I myself saw brown friable bones deep down in this Ramridge End pit. They completely collapsed on being touched. I have a large hacking implement from the Ramridge End pit which weighs 3 lb. 7 oz.

The implements found on the palaeolithic floor at Round Green are specially interesting and instructive. They were found, as before said, on the circumference of a pond of Palaeolithic Age (some at a level that must have been in past times the bottom of the pond), to a depth of 12 ft. During the excavations the entire stock-in-trade of the pond-side dwellers was exposed, and as far as possible every scrap of worked flint was secured. I was present at least one day in every week, and a foreman-digger named Thomas Smith, formerly of Caddington, and his men were most vigilant and energetic. Every stone was shown to the foreman, and during my absence the best were placed in a large shed awaiting my arrival. Some of the implements were found *in situ* by myself.

No one unused to looking for implements and flakes in an often water-logged clay-pit, generally covered with tenacious mud, can imagine the difficulties of seeing and extricating the implements and flakes. To add to the difficulties, the sanitary authorities of Luton were all the while emptying the town refuse into the diggings to fill up the holes as soon as they were made, and get a new level surface, sometimes indeed whilst digging was going on a yard or two away. One circumstance was fortunate: I managed to keep the place secret during the whole time that I was working on it—a period of twenty-seven years. Otherwise the members of local scientific, literary, and philosophic societies would have visited the place like a swarm of locusts and totally destroyed all my work, as was the case in North London.

Twenty-one well-defined sharp-edged implements were found *in situ* on the Round Green palaeolithic floor, and five abraded, ochreous tools in the contorted drift above. One of the former had been broken into three pieces in palaeolithic times; two of the pieces were found and conjoined, the third was not found. Nine sharp-edged knife forms were found, mostly thin, but a few thick; 261 flakes were collected, whilst a few ochreous examples were found in the contorted drift above. Only one distinct sharp-edged core was met with on the floor. A largish flake was replaced on to one implement, and a few of the flakes I refitted together. Most of the implements from the floor were clear ivory-white, a few were of a beautiful palish fawn-colour, others were ivory-grey or grey-fawn. The slightly abraded implements, with a few flakes, found in the contorted drift, varied in colour from ochre to orange-brown and brown.

The shapes and numbers of the sharp implements were as follows :

- 3 subtriangular and acutely pointed.
- 8 pointed ovate.
- 1 triangular ovate.
- 1 sub-pointed with heavy butt.
- 3 ovate with cutting-edge all round.
- 1 pointed.
- 1 elongated oval.
- 1 lanceolate.
- 1 hand-chopper.

The oval, ovate, and pointed ovate forms graduate into each other with no certain line of demarcation.

From the contorted drift came 1 ovate, 1 pointed, and 3 pointed ovate implements. These ochreous tools are not necessarily older than those found on the floor; they were probably gathered up by the moving contorted drift from a surface not far distant.

- Fig. 29. A typical pointed ovate implement, moderately stout with a twisted edge, chipped all over on both faces, and with a cutting-edge all round. Its geometrical perfection is remarkable. Colour, white. L. 4.4 in.
- Fig. 30. A similar but somewhat larger implement. It was broken into three pieces in palaeolithic times and discarded; one piece was found two weeks before the other. The two pieces were conjoined as shown in the illustration; the missing third piece, though long searched for, was not recovered. Colour, ivory. L. 5.1 in.
- Fig. 31. A smaller example, with the upper part slightly injured in palaeolithic times, cutting-edge all round. Colour, ivory. L. 2.7 in.
- Fig. 32. A lanceolate implement, somewhat pointed at both ends, with a cutting-edge all round. Colour, white, faintly greyish. L. 4.4 in.
- Fig. 33. A massive implement of oblong-oval form. To judge by the condition of the upper part, it may have been used as a rude plane, but it would also prove a very handy tool for general hacking, smashing, and rough cutting. Its weight is 1 lb. 9½ oz. Colour, greyish-ivory, somewhat mottled. L. 7.1 in.
- Fig. 34. A subtriangular implement acutely pointed; the workmanship is of the finest possible quality, and the thinness towards the point remarkable. Both sides of the point are shown to illustrate the working, which rivals fine neolithic work. Colour, white, slightly speckled darker. Some flint implements seem to have been much better made than necessary; these were possibly not meant for ordinary use. Certain men and women evidently took great pride in their work, and wished to show what excellent work could be done when the workers were at their best. L. 4.3 in.
- Fig. 35. A piece of tabular flint, probably made with a few touches from a hammer-stone,

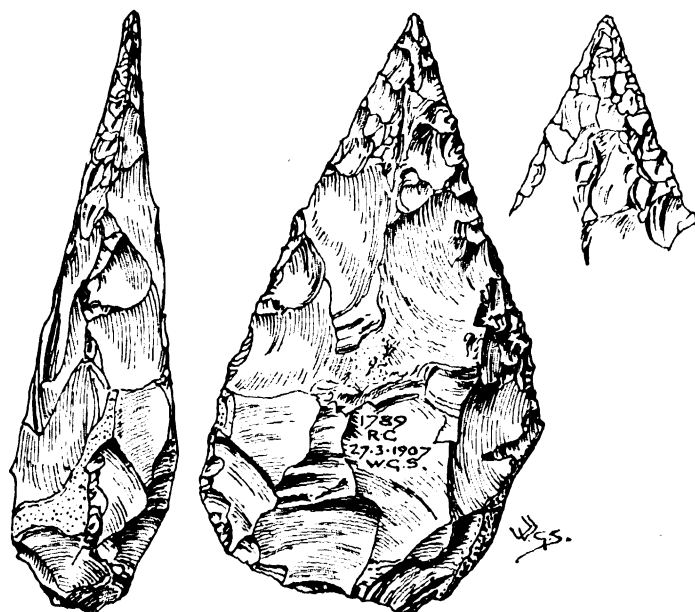


Fig. 34. Sharply pointed implement, side and front views with reverse of point, Round Green. (3)

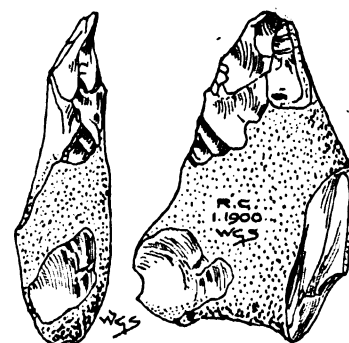


Fig. 35. Implement made from crusted nodule, side and front views, Round Green. (3)

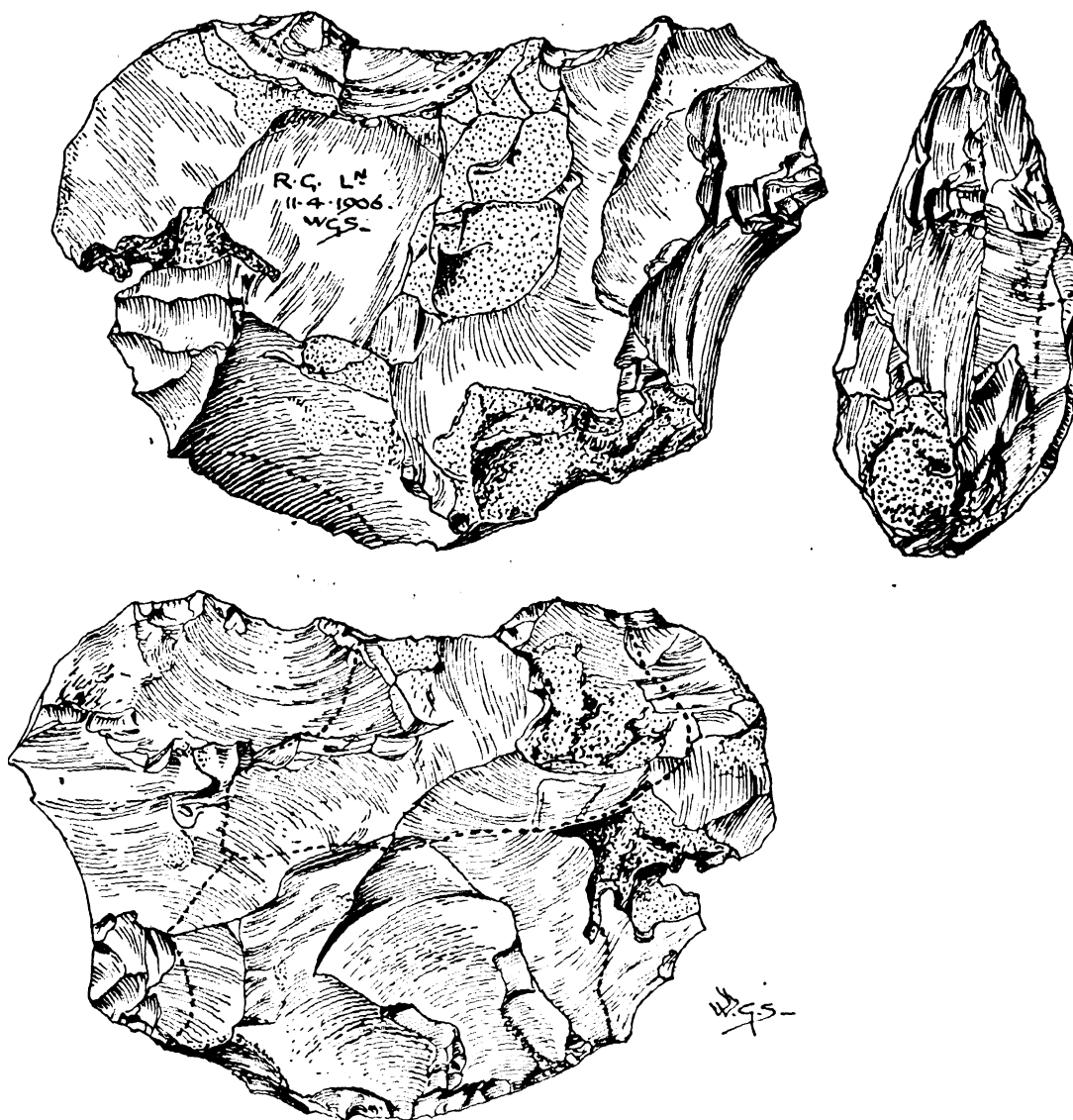


Fig. 37. Front, back, and side views of implement broken by the finder, Round Green. (3)

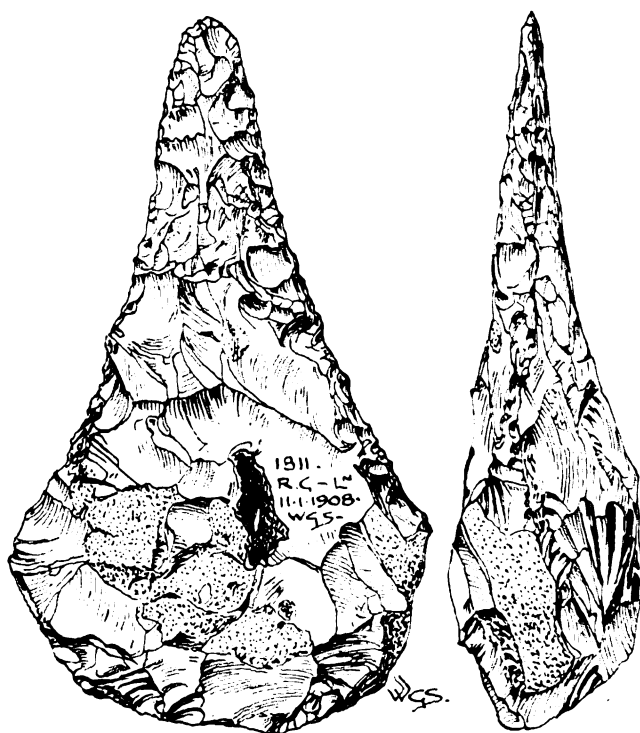


Fig. 36. Implement with incurved sides, front and side views, Round Green. ($\frac{2}{3}$)



Fig. 38. Side-scraper, front and side views, with section, Round Green. ($\frac{2}{3}$)

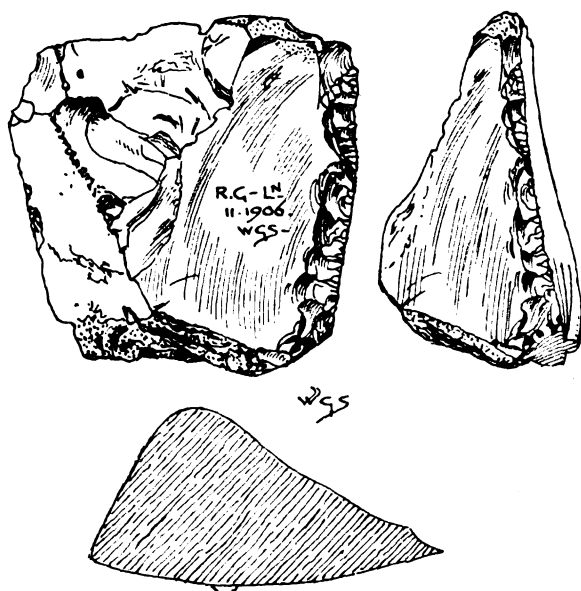


Fig. 39. Thick flake used as side-scraper, front and side views, with section, Round Green. ($\frac{2}{3}$)

VOL. LXVII.

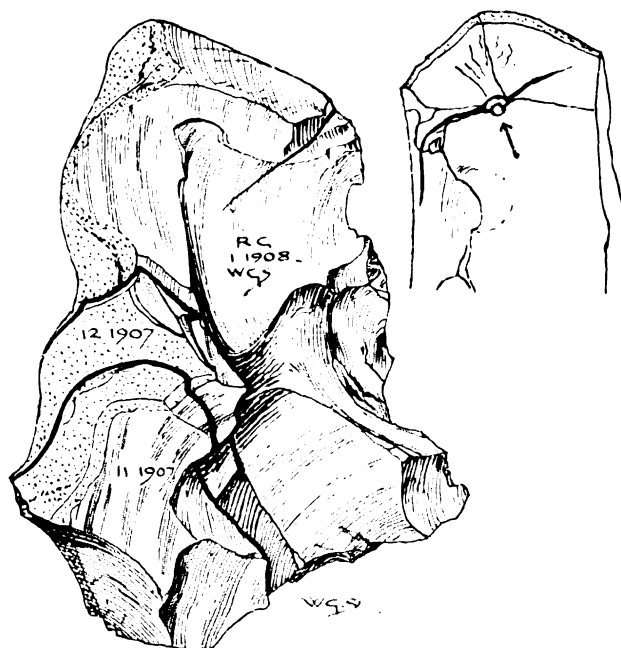


Fig. 40. Three flakes refitted, incomplete fracture on the right, Round Green. ($\frac{2}{3}$)

I.

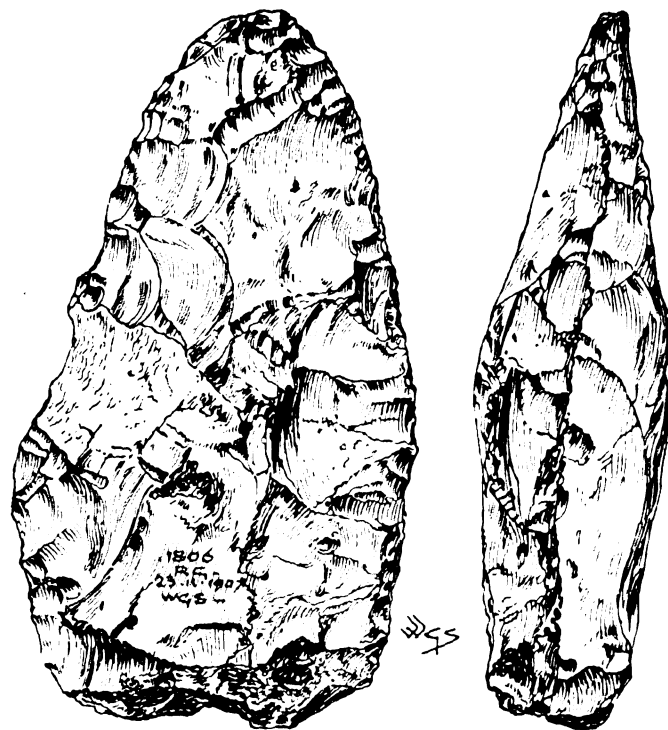


Fig. 41. Front and side views of ochreous implement from contorted drift, Round Green. ($\frac{2}{3}$)



Fig. 1. Cave-interior, 13 April 1914. To right, near head of figure in foreground, top of shelf overhanging bed along eastern wall

Photo: E. F. Guillon

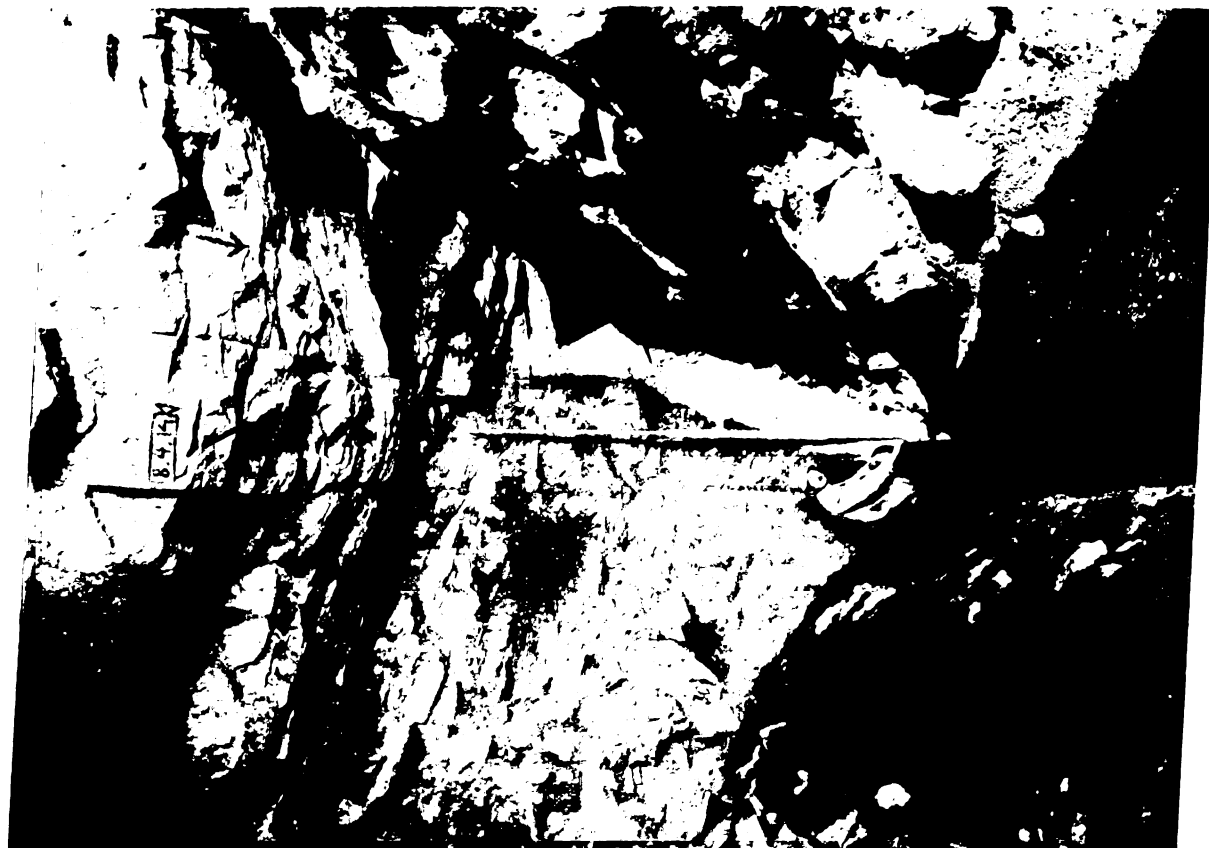


Fig. 2. Eastern wall, a fortnight later. Implementiferous bed extends from right hand of figure to top of stick: below, experimental trench driven 5 ft. below floor-level: cf. p. 78

Photo: E. F. Guillon

IV.—*The Site, Fauna, and Industry of La Cotte de St. Brelade, Jersey.* By
R. R. MARETT, Esq., M.A., D.Sc., Reader in Social Anthropology, Oxford,
Local Secretary for the Channel Islands.

Read 25th November 1915.

THE communication which I now have the honour to lay before the Society of Antiquaries presupposes a knowledge of the contents of my two papers concerning Jersey antiquities already published in *Archaeologia*.¹ I beg to thank the Society for enabling these successive reports on the excavations of La Cotte de St. Brelade to be printed and illustrated on so generous a scale. I would here take the opportunity of likewise acknowledging my debt to many other helpers: first, to Mr. G. F. B. de Gruchy, Seigneur of Noirmont, and owner of the cave, who has not only made over the whole of the treasure-trove to public institutions, providing funds into the bargain in order as it were to exploit himself, but has throughout been my constant adjutant and co-worker; then to my Oxford friends and pupils who have at considerable cost to themselves taken part in the work for weeks and months together, Captain A. H. Coltart and Mrs. Coltart, Mr. T. B. Kittredge, Mr. B. de Chrustchoff, Miss Bayly, Mr. R. de J. Fleming Struthers, the Rev. E. O. James, Mrs. Jenkinson, Mr. P. H. Brodie;² next, to Jersey residents innumerable, most of them ardent members of the Société Jersiaise, such as, to mention but a few, Mr. E. T. Nicolle, Mr. J. Sinel, the late Dr. A. Dunlop, Mr. H. J. Baal, Mrs. Briard, Mrs. Symons, Mr. G. Le Bas, Mr. A. H. Barreau, Mr. E. F. Guiton, the two last-mentioned gentlemen having as draughtsman and photographer respectively helped largely to make our results intelligible by way of the eye; and, finally, to the many experts who have in various ways assisted in the interpretation of what we brought to light, among them being Sir Hercules Read and Mr. Reginald A. Smith of the British Museum; Dr. A. Smith Woodward and Dr. C. Andrews of the British Museum of Natural History; Dr. A. Keith of the Royal College of Surgeons; and Professor

¹ *Archaeologia*, lxii, 449 f., and lxiii, 203 f.

² Mr. de Chrustchoff and Mr. Fleming Struthers deserve special credit for having, during the whole course of operations in 1914 and 1915 respectively, occupied a small and lone cabin on the site itself where the finds had to be temporarily stored under the care of a guardian.

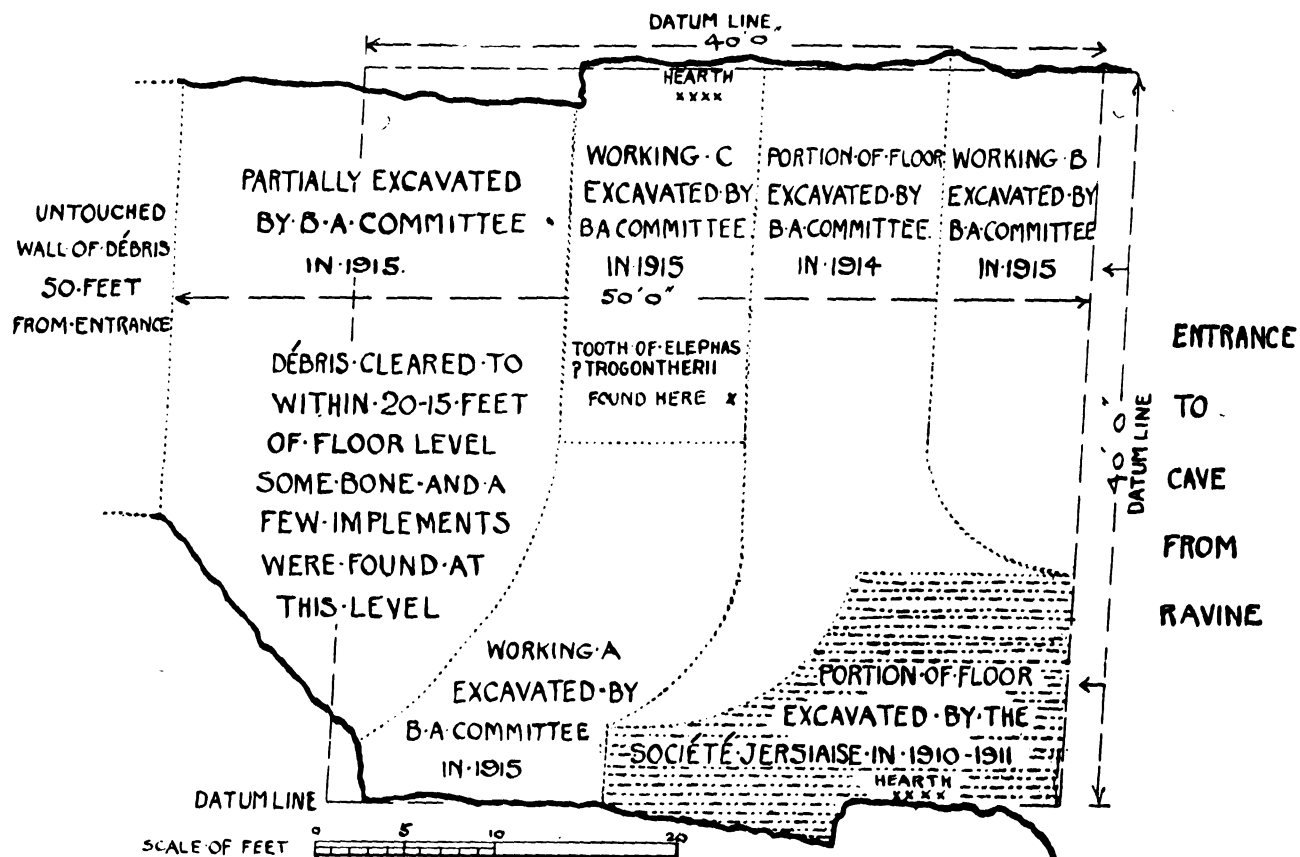


Fig. 1. Ground-plan of cave, showing progress of excavation. H. C. Querée del.

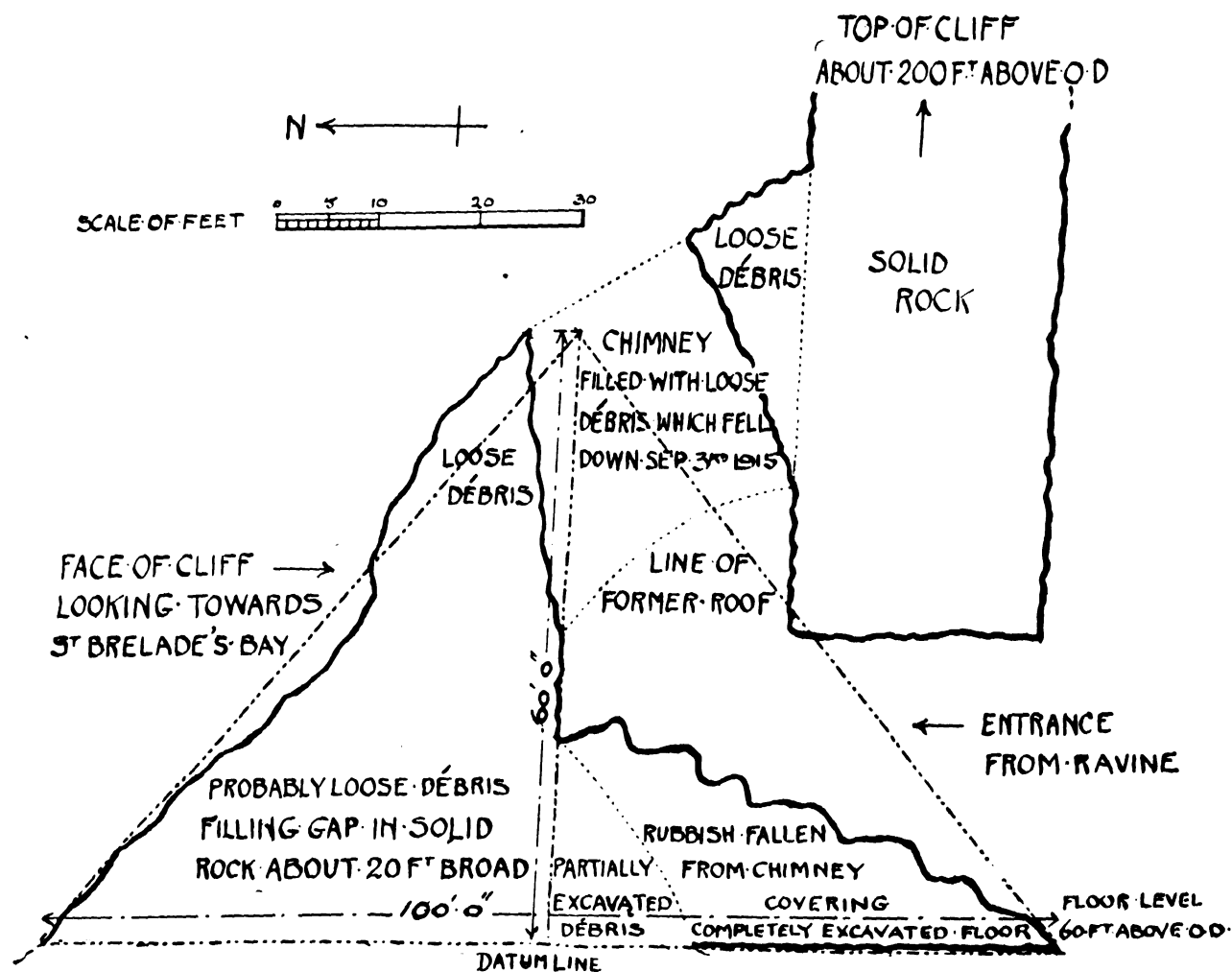


Fig. 2. Vertical section of cave along line 10 ft. from eastern wall. H. C. Querée del.

W. J. Sollas and Mr. H. Balfour of Oxford. Let me add, in order to save the face of my kind allies and advisers, that I am in the last resort responsible for every statement of fact or opinion that appears here.

Scheme of operations.—When the work of the Société Jersiaise at La Cotte de St. Brelade came to a standstill in 1911, the promise of further advance was by no means encouraging. The palaeolithic floor had been opened up to an extent of about 11 ft. square on the western side of the entrance, the cleared area thenceforward narrowing by degrees with an extreme penetration of 26 ft. The implementiferous bed, rarely more than 3 ft. to 4 ft. thick,¹ proved indeed to be exceedingly rich where 8 ft. to 10 ft. inwards along the side-wall there had come to light the remains of a hearth; but, apparently, it thinned out from this centre in all directions almost to nothing. So much for the prospect at floor-level. Above, barring the rest of the entrance, was a mass of débris 20 ft. to 25 ft. high, the top of which formed a V-shaped depression. This was subject to a cross-fire of falling stones, alike from within the cave, where at the N.E. corner a dome in the roof revealed huge suspended blocks as much as 45 ft. up,² and from the ravine outside, where the loose pile of rock-rubbish covering the back rose steeply to an even greater height. No wonder then that a halt was cried. It is true that, in association with Mr. G. de Gruchy, I sought and found in the following year a buried cave, containing, as it turned out, implements of the same Mousterian pattern, some 40 ft. away on the opposite side of the ravine. But here again operations were destined to end abruptly, under stress of the threat of a stony avalanche from above.³

In 1913, however, at my urgent request, the British Association formed a committee to carry on the exploration of the main cave as far as a grant of £50 would take it. It may be remarked in passing that, had ample funds been available from the start, it would have been good policy to lower into the ravine (whence it could scarcely have been recovered intact) an elaborate 'plant', consisting, among other things, of a stout crane and some iron trucks running on rails, whereby the cave-filling might have been systematically demolished from the top downwards with a minimum of effort as well as of danger. As it was, we had to be content with uncovering a strictly limited space down to floor-level, while pushing back the containing walls of débris just so far as might ensure safety for life and limb. Thus the future must be left to take care of itself, the

¹ Just at one spot, 11 ft. in from the entrance and 7 ft. out from the western wall, a flat rock, standing 5 ft. to 6 ft. above floor-level, was found to be strewn with human refuse. See *Archæologia*, lxiii, 205.

² As measured from floor-level.

³ See R. R. Marett, *Compte-rendu du Congrès internat. d'anthropologie préhistorique de Genève*, 1912, i, 359; also R. R. Marett and G. F. B. de Gruchy in *Man*, 1912, No. 93; reproduced in *Bulletin de la Soc. Jersiaise*, xxxviii, 326, and in *Records of the Past* (Washington), 1912, 270.

more so because, if the search proved barren on a first trial, there would be all the less reason for proceeding further.

From 1st March then to 28th April 1914 excavation went on, the work being entrusted to the previous contractor, Mr. Ernest Daghorn, a master of his trade. It was calculated that, if the full £50 went to labour, the inevitable extra expenses being borne locally, a clearing 18 ft. broad could be carried right across the foremost section of the cave to the eastern wall, distant, as it then seemed, but 20 ft. to 30 ft. across. It soon became plain, however, that this wall was considerably undercut, so that at floor-level an average breadth of 40 ft. must be reckoned with. Hence the original plan had to be modified, a trench no more than 10 ft. broad being driven parallel with the entrance, its outer limit falling 8 ft. within the cave. This interior line of advance was selected partly because it coincided with the V-shaped depression overhead, and partly because the bed seemed richer here than by the mouth. Up to the half-way point, indeed, this bed was normally no more than 3 ft. to 4 ft. thick; but as it approached the eastern wall, while the bottom remained almost flush with the bench-mark representing the lowest floor-level, the top rapidly rose until against the wall itself it was no less than 10 ft. to 12 ft. high.¹ Partially protected as it was by a shelf that jutted out some 12 ft. from the wall, this easternmost portion of the human deposit seemed at length to offer some chance of stratigraphical analysis. Meanwhile, the total yield was considerable, amounting to more than 10,000 flint fragments and about half that number of pieces of bone. As for the trench, enclosed though it was by precipitous ramparts of débris that perpetually threatened collapse, it held to the end of the year's work, when it had to be filled with sterile rubbish from above in order to seal the workings against casual depredations.

It remains to add that, in order to make sure that the bench-mark taken to represent the lowest floor-level held good everywhere—as indeed it was found to do—the trench was lowered for an extra 5 ft. without striking bottom.² This probing of the depths brought out the same facts as the similar experiment made in 1911 near the western wall. While traces of man were entirely lacking, there occurred, sandwiched between layers of clay, of which the upper one contained calcareous concretions or *Lösspuppen*, a black gritty deposit that in places was 2 ft. thick or more. There is reason to think that this deposit is largely of vegetable origin, but systematic exploration of the pre-Mousterian substratum down to bed-rock is needed before a final interpretation can be essayed.³

¹ The implementiferous bed along the eastern wall was uniformly about 10 ft. thick, and never more, but its base was 2 ft. above floor-level from about 18 ft. from the entrance inwards.

² See pl. XIII, fig. 2, in which this experimental trench is to be seen.

³ See also the detailed account of the work of 1914 in *Report of the Brit. Assoc.*, 1914, 230-4, reproduced, with five plates added, in *Bulletin de la Soc. Jersiaise*, xl, 63-9.

The results obtained in 1914 were so satisfactory that the Committee of the British Association resolved to undertake a fresh campaign of excavation, obtaining another contribution of £50 from that liberal body for the purpose. Moreover, the Government Grant Committee of the Royal Society generously provided a similar sum. A threefold task was now to be faced. First, the attack was to be pushed home along the western wall, though the Société Jersiaise had reported a dearth of finds when once 20 ft. of penetration was exceeded along this line. This section was afterwards known as Working A. Secondly, the strip, 8 ft. thick, that still extended across more than half of the entrance, must be dug out, there being good hope of a rich haul here, at any rate as soon as the eastern wall was approached. This became Working B. Lastly, most formidable business of all, there was the huge mass of débris towering up to 45 ft. in the NE. corner to be pushed back somehow for at least a little way, and, more particularly, so as to free the part nearest to the eastern wall, where the bed of 10 ft. thickness showed every sign of continuing inwards. This was known up to the half-way point as Working C, whence it passed into Working A. According, then, to this threefold scheme, operations were renewed from 1st July to 4th September 1915.

To deal first with Working B, the human deposit throughout the middle part of the cave was found to be even poorer and thinner near the threshold than it had proved to be farther in. On the other hand, it grew rich and thick as it neared the eastern wall, corresponding in all respects with the bedding of the parallel strip to the north. Progress on this side involved much cutting-back of the talus masking the back of the ravine; and, though work outside the cave was merely incidental to work within, clearance enough was made to render it probable that the margin of the implementiferous stratum coincides with the line of the entrance.¹ At any rate, nothing was found beyond this limit, with the exception of some human remains to be mentioned hereafter.

In Working A, 12 ft. of additional penetration revealed a re-entering corner, where, after bending in at right angles for about 3 ft., the western wall slopes inwards at an angle of 45° for at least another 12 ft. The roof here for about a third of the way across is not more than 25 ft. to 30 ft. high, and, apart from a loose slab or two, is evidently quite solid. From this side, then, as from a sort of penthouse, it was found possible to stretch grappling irons across to the overhanging masses of débris in the NE. corner and so to precipitate downfalls that eventually benefited Working C, even if often obliterating it for the time being.

¹ It is just possible, however, that the bed awaits discovery outside the entrance at a lower level than was reached by our excavation, which went no farther down than our conventional floor-level; for 40 ft. away on the other side of the ravine, where Mr. de Gruchy and I found a cave in 1912, Mousterian implements occurred at a point about 8 ft. below the floor-level of the main cave to the north. See *Man* (1912), No. 93, p. 117.

To promote such demolition of the most dangerous part of the cave-filling was perhaps the chief function of Working A, though it was by no means the case that from 20 ft. onwards it was utterly barren of the relics of man. Bone, indeed, was scarce and in poor condition, owing to the prevalence of damp in this corner. Flint implements, on the other hand, were to be found scattered here and there along a sharply rising plane, and I happened myself to discover, together with several other implements, a fine specimen of the Mousterian 'point' that lay near the wall no less than 43 ft. from the entrance and 15 ft. above floor-level.¹

Working C, assisted as has been shown by a flank attack conducted from Working A, eventually resulted in the complete clearance of a 10 ft. strip extending parallel to the entrance from the half-way point to the boundary wall. The distribution of the human deposit here corresponded in most respects with that which occurs throughout this eastern half of the cave. It was thinnest towards the centre; though 18 ft. out from the eastern wall it was already 6 ft. thick. At the wall itself it showed the usual 10 ft. of thickness; the bottom of the bed standing hereabouts some 2 ft. above the lowest floor-level, and the top 12 ft. The presence of a great deal of burnt bone, accompanied by many hammer-stones though but few well-worked flints, indicated the former presence of a hearth along the wall for a space of 20 ft. to 25 ft. from the entrance. Altogether, it was a fairly prolific spot, though by no means so prolific as the adjoining strip excavated in the previous year.

The net result of these operations of 1915 was that over 5,000 flint fragments and about as many pieces of bone were collected. Some 1,200 square feet of the palaeolithic floor had now been unearthed and thoroughly examined, this total comprising about 250 excavated in 1910 and 1911, 350 in 1914, and 600 in 1915. For every square foot thus opened up at least a ton of the cave-filling had been removed by sheer manual effort. Nor was this all. The upper part of the wall of débris to the rear had been cut back to a uniform distance of 50 ft. from the entrance, so that a further area of about 600 square feet lay partially cleared down to within 20 ft. to 15 ft. of floor-level. The top of this half-demolished pile was already proving productive, implements and bone occurring in plenty 32 ft. in near the eastern side-wall, and more sparsely 43 ft. in along the re-entering western wall. On 3rd September, however, the roof overhanging this rearmost part of the cave suddenly fell in, completely smothering all our workings under some 500 tons of rock-rubbish. Though nine persons were inside at the time, no one was hurt, thanks to a hurried exit. As soon as the dust cleared, one saw daylight streaming down through a hole some 20 ft. in diameter (fig. 3). Thus the

¹ This was on the morning of 2nd September, and, as there was a dangerous fall of rock here a few minutes afterwards, and the roof finally caved in next day, there was no subsequent opportunity of finding out how far down the implementiferous bed went at this point.



Fig. 3. Interior of cave after the collapse on 3rd September 1915.

hypothesis of an aperture communicating with the northern face of the cliff, whereby the cave had been filled as through a funnel, was signally confirmed.¹ Further falls due to the winter rains have since lengthened the gap, so that it now measures at least 30 ft. from its southern extremity, where the live rock rises vertically for about 140 ft. above floor-level, to its northern end, where a thin partition, the top of which was 60 ft. above floor-level, but is now lower, separates the excavated part of the cave from the open air. Actual quarrying can alone decide whether in the course of pushing through to the northern face of the cliff—a matter of a few feet for half the way down and 50 ft. at floor-level—solid rock or mere débris is to be encountered.² In any case it would not seem likely that in Pleistocene times La Cotte was rather a tunnel than a true cave. The blocks composing the cave-filling are mostly large, and usually seem, if detached, yet to be still lying almost *in situ*. Hence one is tempted to suppose that, under the combined stress of breaching at the top and weathering to the rear, there gradually collapsed a solid enclosure of granite which once protected the back of Mousterian man from boreal draughts. Such a problem, however, can be resolved, if at all, only by complete excavation of the site. In 1916 it is hoped to make a clean sweep both of the wreckage from the roof and of whatever remains of the unexplored cave-filling beneath it.³

*Osteological remains.*⁴ (a) *Man*.—It is disappointing that recent operations have added nothing, or at any rate nothing unambiguous, to the thirteen teeth which testify to the bodily presence in this cave of *Homo Neanderthalensis*.⁵ The thick and sheltered bed along the eastern wall would afford ideal conditions for

¹ I put forward this hypothesis originally in 1910 (see *Archaeologia*, lxii, 453) in opposition to a suggestion made in *Man* (1910), No. 102, p. 185, that, apart from blocks fallen from the roof, the cave-filling was due to a lateral thrust of rock-rubbish from the ravine to the south. In 1914 we sank an experimental shaft on the north side of the cliff forming the back of the cave, and conjecturally identified the top of the supposed funnel with the very spot that has since fallen in.

² After a tentative excavation in January 1916, which resulted in the removal of about 50 tons of débris from the northern face of the cliff, Mr. Daghorn gave it as his opinion that it would not be feasible to clear out the cave from this side.

³ For an account of the operations in 1915, see *Report of the Brit. Assoc.*, 1915, and also the separate and very full account in *Bulletin de la Soc. Jersiaise*, xli, 154 f.

⁴ All bone found in the cave, with the exception of a few duplicate specimens in the possession of the British Museum of Natural History, is at present in the museum of the Société Jersiaise in Jersey.

⁵ In *Archaeologia*, lxii, 456, I ventured to term the owner of the teeth in question *Homo Breladensis*, seeing that Professor Keith in *Journ. Anat. and Physiol.* (1911), xlv, 12 f., discovered in them an extreme form of primitiveness falling somewhere between the ordinary type of the Neanderthal man and the type of *Homo Heidelbergensis*. I had no intention, however, of suggesting that we had here anything more than a new variety of man. Hence, if M. Boule insists (see *L'Anthropologie*, xxii (1911), 675, and xxvi (1915), 36) that such a denomination should be reserved for a specifically distinct kind of man, I am quite willing to withdraw the expression in favour of the term *Homo Neanderthalensis*, which undoubtedly applies in a broad sense to the Jersey specimen.

the preservation of human remains, and one can only hope that such will one day come to light in those inmost recesses that still lie hid. By way of compensation, however, a rather curious discovery has been made of the fragments of a human skull which is probably, but not indubitably, of the modern type. These did not occur, however, inside the cave. At the very outset of operations in 1915 it was necessary to remove a portion of the talus at the back of the ravine in order to effect a means of approach. Here, 6 ft. beyond the entrance of the cave and 18 ft. above floor-level, were found together three pieces of bone. Mr. Daghorn, the contractor, must go bail for the facts, since no archaeologist happened to be present. Dr. A. Keith, to whom the fragments were submitted, reports that the first and largest is part of the left side of the occipital portion of a human skull, showing a sutural border. It is very thin, and is considerably contorted. Dr. Keith attributes it to a child not more than 6 years of age. In his view, it bears both inside and outside all the marks of the modern, as contrasted with the Neanderthal, type of man.¹ The contortion he considers to be the result of a partial cremation. The second fragment is an imperfect malar of somewhat anomalous shape. Dr. Keith thinks that its curvature and its porcelain-like resonance can alike be accounted for on the hypothesis of a partial combustion, and would therefore refer it to the same cremation. The third fragment is too small for certain diagnosis, but appears likewise to be human, and is possibly part of a lower jaw. In the light of such findings it would be unwise to suggest any connexion between these human relics and the institutions, whether funerary or culinary, of the Mousterian cave-dwellers. The remains might well belong to some much later age that practised cremation, and have slipped down into the ravine from the top of the cliff, where, as witness both the ruins of a small battery and the existing cabin, a human 'station' would not have been out of place. If the formidable task of dismantling the back of the ravine were to be taken in hand, further elucidation of the mystery might follow.

(b) *Other animals*.—A striking result of the latest excavations is the great increase in the number of animal species that can now be assigned to Pleistocene Jersey. In 1910 woolly rhinoceros, reindeer, red deer, horse, and ox—five kinds in all—were discovered, while 1911 added sheep or goat. The list of species

¹ Dr. Keith in subsequent conversation seemed inclined to pronounce judgement somewhat less decidedly. After all, the skull of a child, even if it were one of the Neanderthal type, would be thin in any case; and, for the rest, the original character is bound to be somewhat obscured by the effects of cremation. It may be noted that two interments of Palaeolithic age seem to have been made over a hearth while the fire was still burning, namely, at Mentone and Solutré; cf. W. J. Sollas, *Ancient Hunters and their Modern Representatives* (2nd ed., 1915), 383.

now amounts to twenty-eight.¹ The following determinations are due to Dr. C. Andrews, of the British Museum, who was assisted by Miss D. M. A. Bate as regards the birds :

- Mammalia. Ungulata* : (1) *Elephas ?trogontherii* (A primitive form of mammoth).
 (2) *Elephas primigenius* (Mammoth).
 (3) *Rhinoceros tichorhinus* (Woolly rhinoceros).
 (4) *Cervus megaceros* (Great Irish elk).
 (5) *Cervus tarandus* (Reindeer).
 (6) *Cervus elaphus* (Red deer).
 (7) *Cervus ?capreolus* (Roe deer).
 (8) *Cervus sp.* (Another kind of deer).
 (9) *Equus* (Horse).
 (10) *Bos primigenius* (Urus).
 (11) ? (Sheep or goat).
Carnivora : (12) *Hyaena crocuta, var. spelaea* (Cave hyena).
 (13) *Canis ?lupus* (Wolf).
 (14) *Canis vulpes* (Fox).
Rodentia : (15) *Dicrostonyx torquatus* (Arctic or banded lemming).
 (16) *Microtus ratticeps* (Vole).
 (17) *Arvicola sp.* (Water rat).
 (18) *Lepus ?cuniculus* (Rabbit).
Insectivora : (19) *Sorex araneus* (Shrew mouse).
Aves. Anseriformes : (20) *Anser brachyrhynchus* (Pink-footed goose).
 (21) *Bernicla leucopsis* (Barnacle goose).
 (22) *Bernicla brenta* (Brent goose).
Gruiformes : (23) *Gallinula chloropus* (Moorhen).
Charadriiformes : (24) ? (Small wader).
Passeriformes : (25) *Cinclus aquaticus* (Dipper).
Galliformes : (26) *Tetrao sp.* (A grouse, possibly blackcock).
 (27) ? *Lagopus mutus* (Ptarmigan).
Falconiformes : (28) *Falco tinnunculus* (Kestrel).²

¹ In the case of ox, horse, reindeer, and ?rabbit considerable discrepancies occur in the size of teeth and other bones. Thus it may well be that bison coexists with urus, Prjewalski's horse with the 'forest horse', caribou with a smaller reindeer, and Arctic hare with rabbit.

² Of the mammals, No. 14 was found in 1914 only; Nos. 1, 8, 13, 16, 17, 18, 19 in 1915 only. Of the birds, No. 26 was obtained in 1914, the others in 1915. Amongst the mammals, reindeer, horse, ox, and lemming are exceedingly common, the rest being more or less rare. The birds are in each case represented by no more than an odd bone or two. Not much stress, however, can be laid on the argument from relative frequency. A mere remnant has survived of the rich store of bone that must obviously have existed formerly; while, of the fragments that remain, comparatively few are determinable, thanks partly to the disintegrating effects of time, and partly to Mousterian man's systematic search for marrow.

No bone was used in evidence that either from its condition, or from its place in the débris, appeared to be of recent origin. Indeed, away from the implementiferous bed, bone was hardly discoverable anywhere, and the occurrence of a few fragments high up near the roof—they appeared to belong to ox, sheep or goat, and rabbit—was noted as a wonder. Of course, though the greatest care was taken, it was not possible to prevent falls of rubbish such as might cause an occasional bit of bone, especially if it were one belonging to a small animal, to slip down unnoticed; but this must have happened quite exceptionally, if at all. It may be stated, then, with considerable confidence, that the bones of all the species mentioned in the foregoing list were found in close association with implements of Mousterian pattern. They would therefore seem to be of Pleistocene age. This conclusion is fully borne out by the character of the fauna, not excluding the avifauna. The list of species implies an environment ranging from steppe to tundra.¹

From the standpoint of stratigraphy, there was not much to be gathered

¹ The reindeer and banded lemming, to judge by their present habits, belong on the whole to the tundra, though of course they are migratory. Indeed, the latter is the most characteristic land mammal of the treeless north (cf. W. B. Wright, *The Quaternary Ice Age*, 222). The extinct mammoth and woolly rhinoceros were steppe and tundra forms, with a predilection for distinctly cold weather. *Elephas trogontherii*, though the contemporary of *E. antiquus*, would seem to have had a more Continental and eastern, and therefore a colder, range (cf. W. Soergel, 'Elephas trogontherii Pohl. und Elephas antiquus Falc.' in *Palaeontographica*, lx (Stuttgart, 1913). See especially *ad fin.*). The voles belong rather to the steppes. *Microtus ratticeps*, a large long-skulled mouse with relatively heavy teeth, is still found in Northern Eurasia, but is locally extinct. According to Mr. Hinton, it reached Britain from France during the latter part of the 'middle terrace' stage (G. E. H. Barrett Hamilton and M. A. C. Hinton, *A History of British Mammals*, Part xvi (November, 1914), 469). Various small unidentified species of *Arvicola* occur in the Middle Pleistocene of Grays Thurrock and Ilford, but are not encountered again in Britain until the Ightham horizon, when *A. abbotti* is numerous (*ibid.*, 477). As regards the shrew (identified by means of a single imperfect skull), it is true that *Sorex araneus* proper first appears in Britain only in the latest Pleistocene deposits, but an extinct species, almost of the same size, occurs in the 'middle terrace' brick-earth of Grays, in Essex (*ibid.*, Part viii (September 1911), 80, 86). The known range of *Hyaena spelaea* in Pleistocene times accords perfectly with the theory of a prevailing sub-arctic climate, even if it be true that it is but a variety of *H. crocuta*, now confined to Africa. Of the remaining species of mammals none, in respect either to its habitat or to its place in the time-series, is suspect, with the possible exception of sheep or goat, and rabbit, seeing that their bones likewise occurred high up in the débris, and may consequently be intrusive when found at a lower level. Yet as regards the latter species, at any rate the rabbit is known from Pleistocene deposits both in Britain and on the Continent (*ibid.*, Part x (February 1912), 173), while possibly the present remains are those of the Arctic hare. Of the birds, the two grouse are no longer found in Jersey; the pink-footed goose and the barnacle, though probably visitors, are not definitely recorded; the dipper is rare; and the brent goose, moorhen, and kestrel common. The geese and waders at present breed in the Arctic regions; the ptarmigan is an Arctic or mountain species, while the blackcock has a more temperate though northerly range; the dipper and the kestrel range far north in summer; and the moorhen extends at least as far north as Scandinavia. I owe the information about the birds to my co-worker, Mr. de Gruchy.

from the relative positions of these animal remains. For one reason, the determinable portions were not enough to be taken to represent the unidentified remainder. Again, the bone in good condition was almost invariably found immediately beneath one or other of the largest stones, such as could not have lodged in the human deposit without causing much dislocation. Otherwise, there might have been a better chance of estimating the extent of the climatic changes that took place during the Mousterian occupation, a change that is usually supposed to have been on the whole from warmer to colder conditions, though not perhaps without minor fluctuations. As it is, there are but two sets of facts that have some stratigraphical value. In the first place, whereas the remains of *Elephas primigenius* (associated with some of *Rhinoceros tichorhinus*) occurred at the very top of the implementiferous bed, where near the eastern wall it is 10 ft. thick, those attributed provisionally to *Elephas trogontherii* were found at the very bottom of the bed, though 18 ft. out from this wall where the thickness amounted only to 6 ft.¹ There was thus a difference of 10 ft. in the relative heights at which the two finds were made. It is surely not without significance that the older animal should be found so far below. On the other hand, it may be argued with some assurance that there is nothing belonging to the human occupation of the cave that is posterior to the age of the mammoth; for three teeth of that animal were collected with my own hands on the very surface of the bed at the one spot where superincumbent débris was absent, namely, where a projecting shelf of rock afforded almost complete shelter to whatever accumulations might form beneath. In the second place, it is interesting to observe that the remains of the lemmings and voles occurred in several thick clusters that lay uniformly on or near the top of the human deposit, as notably along the eastern wall. It would look as if the close of the period of

¹ The tooth on which the determination depends is almost entire, thanks to the care with which it was rescued from the bed by my friends Messrs. R. de J. Fleming Struthers and P. H. Brodie, the former of whom afterwards treated it most successfully with gelatine. It is probably the first upper molar. Eleven plates are preserved, the number lost being uncertain. Three wear-surfaces are complete, two partly worn. The width at the wear-surface is 50 mm. The height (at vii) is 156 mm. The enamel is about 2 mm. thick. The length as preserved is 139 mm. Into this length the number of the plates goes about thirteen times. Such a proportion seems too low for *Elephas antiquus*, but, on the other hand, is too high for *E. primigenius*. Hence Dr. Andrews is inclined provisionally to assign the tooth to *E. trogontherii* (Pohlig). The characters of its molars are carefully differentiated by W. Soergel in *Palaeontographica* (1913), lx, 6, 7. He notes that this elephant seems to pass into the primitive form of the mammoth from the second interglacial period onwards. For an illuminating monograph on Pleistocene elephants in general, with references to the literature of the subject, see P. Zuffardi in *Palaeontographica Italica* (1913), xix, 121. I owe these two references to Dr. Andrews and Prof. Sollas respectively. The exact spot at which the tooth was found on 23rd August 1915 was 18 x 23 x 2 (i.e. feet from the entrance, the W. wall, and floor-level respectively, cf. p. 112). The mammoth teeth, on the other hand, were found on 20th April 1914 at 18 x 39 x 12.



Fig. 1. Tooth of *Elephas ? trogontherii*: general view

Photo: E. F. Guillon

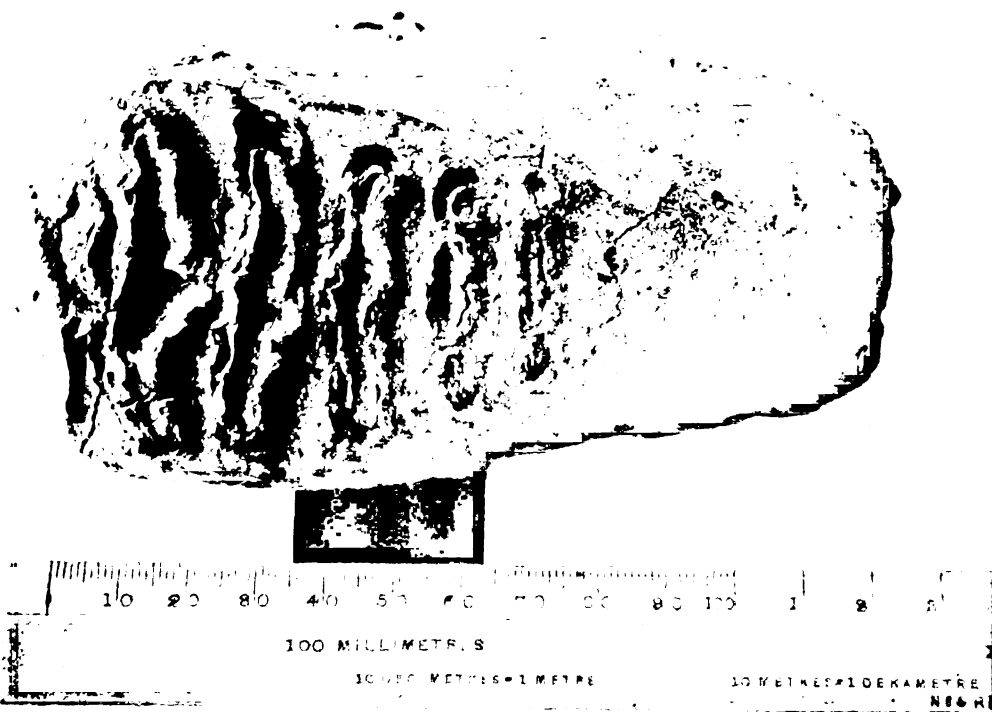


Fig. 2. Tooth of *Elephas ? trogontherii*: view showing wear-surfaces

Photo: E. F. Guillon

human occupation coincided with the formation of one of those 'rodent-beds', of which several Continental sites afford examples.¹

Finally, it ought to be mentioned that a single shell of *Purpura lapillus*, L., in good condition, was found lying in the heart of the implementiferous bed in Working B, as I am able to testify from personal inspection. It is quite possible, however, that it was introduced by some accident after our trench was opened up, being perhaps dropped by a bird. I should, therefore, be reluctant to draw any far-reaching inference from so questionable a datum—as, for

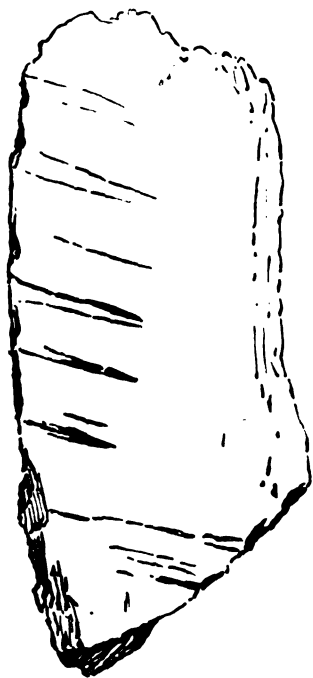


Fig. 4. Fragment of bone showing striations. (†)
A. H. Barreau del.

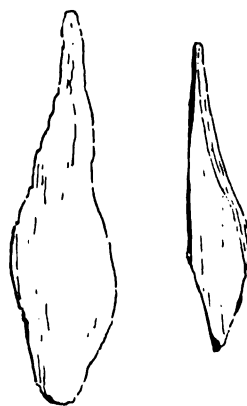


Fig. 5. Bone awls (?). (‡)
A. H. Barreau del.

instance, that during the Mousterian occupation the cave was not far from the sea. But it is right to record the fact for whatever it may be worth.

Artefacts. (I) *Bone*.—A discovery of some interest is that of a small piece of bone on which is to be seen a number of cuts such as might be made with a sharp instrument (fig. 4). It came from the upper part of the bed in Working B.

¹ Thus, at Sirgenstein there are two layers of this character—the lower one occurring immediately over the Mousterian, and the upper corresponding to an Early Magdalenian horizon; while the latter consists of *Myodes* (= *Dicrostonyx*) *torquatus* exclusively, the former yields *M. torquatus* in association with *M. obensis*. See R. R. Schmidt, *Die diluviale Vorzeit Deutschlands* (Stuttgart, 1912), 20, 160. Mr. de Gruchy suggests to me that, since the closely-allied lemming of Norway has the habit of emigrating in huge swarms, herein may lie the clue to the peculiar distribution of the remains of its Pleistocene congener. As regards the place where the lemming remains were found, one cluster occurred at 8 × 39 × 10 and another at 22 × 34 × 12, that is, in each case on the very top of the bed, which rose 2 ft. as it went farther in.

Dr. Smith Woodward and Dr. Andrews agree that the cuts are of artificial origin. One is naturally led to compare the similarly marked pieces of bone found in considerable quantity by Dr. H. Martin at the Mousterian station of La Quina.¹ M. Commont offers some enlightening suggestions as to the probable way in which such striations were caused.² A primitive artisan who was engaged, let us say, in trimming a branch with the aid of a flint implement, might naturally pick out a bone from amongst the cave-litter so as to provide a firm rest for what he held in his hand; whereupon a certain number of his attempts to cut or scrape would find their way down to this makeshift carpenter's bench. M. Commont himself discovered two pieces of bone showing signs of having been used as 'anvils' (*enclumes*) at Montières-les-Amiens, the industrial horizon of which he assigns to the very base of the Mousterian.

It is also to be noted that several sharply-pointed pieces of bone were found, such as may well have served as drills (fig. 5). One of these, in an excellent state of preservation, was almost certainly cut and not broken; but whether this was done with the design of shaping an implement, and not merely in the course of extricating the marrow, must remain a matter of speculation. Another specimen, which is somewhat worn, is of a rounded make. This might conceivably be the result of art, but is more probably due to disintegration of the outer parts. Altogether, a convincing example of a bone implement is still to seek from this site.

(2) *Industry in flint.*³—In the rest of this paper the opportunity will be taken of giving a rather detailed account of the industry of this site as illustrated by the finds of the last two years. It must be remembered, of course, that stored in the museum of the Société Jersiaise is a splendid collection of worked flint representing the fruits of our labours in 1910 and 1911. With this earlier material I have dealt elsewhere, though it cannot be said to have yet been studied as systematically as could be wished. During 1914 and 1915, however, when the excavation was under my personal direction, I sought to

¹ See H. Martin, *Recherches sur l'évolution du Moustérien dans le gisement de La Quina (Charente)*, 1907-10, vol. i. *Industrie osseuse*.

² V. Commont, *Les Hommes contemporains du Renne dans la Vallée de la Somme* (Amiens, 1914), 134; and *id.*, *Compte-rendu du Congrès internat. d'anthropologie préhistorique de Genève*, 1912, i. 298.

³ All flint or other stone used by man from this cave, with the exception of a type-series of something over 100 specimens presented with the approval of the Société Jersiaise to the British Museum, is at present in the museum of the Société Jersiaise, where full facilities for studying it are provided. The figured specimens are labelled S.J. or B.M. accordingly. Those in Jersey were drawn by Mr. A. H. Barreau, and I cannot thank him enough for the trouble he has taken. Mr. Reginald A. Smith had the others drawn for me at the British Museum, and likewise was kind enough to furnish me with their descriptions, which I reproduce with a few slight modifications.

establish the foundations of such a systematic study by enforcing the rule that henceforth every piece of flint without exception should be carefully preserved. Thereupon 15,070 fragments of flint and 854 pieces of other stone used by man, the whole collection weighing about a quarter of a ton, were duly stored and sorted. Now since it can be laid down with some certainty that there is no flint in the cave which was not introduced by the hand of man, it at once becomes possible to compile an accurate statistic in regard to the proportion of used to unused flakes, and so to take a measure of the ancient flint-knapper's intelligence as applied to the avoidance of needless waste. It stands to reason that in a flint-producing region similar results could not be expected, since parsimony would there be wholly out of place. But Pleistocene Jersey called for what may almost literally be described as a skin-flint policy; and, as will presently be seen, it speaks well for the wits of Mousterian man that he answered so well to the test thus imposed upon him. Such, then, was the first and more simple of our statistical tasks.

The second task was to divide up the implements of seemingly determinate shape into their natural groups, showing at the same time how each group stood to the rest as regards the number of implements it contained. Now the constitution of any type-series is at best a risky business, and the student of worked flint is faced by a choice between three different principles of classification, with the risk of perpetrating a cross-division if he tries for a compromise. First, there is the genealogical principle. Implements may be distinguished according to the supposed process of their manufacture. Secondly, there is the functional principle. They may be differentiated according to the supposed use to which they were put. Thirdly, there is the morphological principle. They may be classed according to the shapes which they actually display. Of these three principles the last, being the most objective, the most dependent on direct perception as contrasted with the speculative imagination, would seem to be the safest, at any rate for the purposes of a preliminary survey of a rather large mass of material. A purely morphological classification is bound to ignore distinctions of a genealogical and functional import. For instance, distinct processes of manufacture may result in convergent forms which mere morphology is content to treat as identical. Or, again, implements which might be classed variously as a scraper, a knife, and a saw, according to the usage which the edge would seem in each case to have suffered, will perhaps nevertheless so agree in their general pattern as to be referable to the same morphological type. Morphological descriptions, therefore, ought to be supplemented and qualified by considerations both of origin and of function before the last word is said concerning particular implements. In taking stock of the material from this cave, however, it was deemed best to

rely exclusively on morphology to supply a type-series. From such a humble basis of observed fact one may proceed to loftier constructions of the theoretical order, returning again thereto whenever, as so often happens, the theoretical construction threatens to give way and leave one in the air.

Economic use of material.—The first thing, then, to be done with the large quantity of flint that awaited analysis was to separate the unused portion from the used, while further subdividing what was used into the merely used, that is, accidentally flaked in the course of employment as a makeshift tool, and the trimmed, that is, deliberately chipped into shape.¹ Now it is not always easy to decide whether the breakages visible along the edge of a given piece of flint are due to its use as a human instrument or to some crushing process—a chance footstep, for instance—to which it may have been subjected. Hence care was taken to submit all doubtful cases to a plurality of opinions. Moreover, it was thought advisable to work over the finds of 1914 and 1915 quite independently and then to compare results. If the criteria were arbitrary, the results would not improbably be disproportionate. The subjoined table, however, would seem to show that, if the sorters erred, there was at least a method in their aberrations:

STATISTIC OF USED AND UNUSED PIECES, 15,070 IN ALL.

	1914.	1915.	Total.
A. Trimmed Pieces.			
Above 40 mm. in length	2,395	1,151	3,546
Below 40 mm. in length	657	265	922
	3,052	1,416	4,468
B. Used Flakes.			
Above 40 mm. in length	932	593	1,525
Below 40 mm. in length	2,611	1,030	3,641
	3,543	1,623	5,166
A and B together	6,595	3,039	9,634
C. Unused Pieces.			
Flakes above 40 mm. in length	508	387	895
Flakes below 40 mm. in length	3,047	1,250	4,297
Cores above 40 mm. in length	148	96	244
	3,703	1,733	5,436

It appears from these figures that hardly more than one piece of flint in three had to be rejected as an absolute 'waster'. Moreover, of these unused remnants only about one in five is of any considerable size, the rest consisting of mere chips less than two inches in length. Have we not, then, in this careful

¹ For this distinction, see R. A. Smith in *Archaeologia*, lxii, 526.

husbanding of his resources an eloquent proof of the intelligence of Mousterian man? Though the savage is proverbially prodigal, this big-brained savage of old could apparently practise strict economy when he happened to be short of raw material. Doubtless we must allow for the possibility, suggested by M. Commont, that, if all the flint or most of it had to be brought from a distance, it was imported, at least partly, in the form of prepared cores, the superfluous portions being left behind at the place of origin.¹ Nevertheless, the nature of the flint-refuse found in the cave, consisting as it does in considerable part of shavings of crust, proves that this was a workshop where implements were fashioned on a large scale, as well as a living-place where the same precious implements were used until, not infrequently, they became altogether unusable.

When the waste products had been eliminated, the next task was to discriminate, in the case of the used flint, between the untrimmed amorphous flakes and such pieces as had been worked up into some sort of a shape. Here it was by no means easy to draw a hard-and-fast line. Whereas rather more than half of these were clearly too irregular in form to rank as anything more than mere *outils de fortune*, the rest seemed to represent every grade from the highly-finished symmetrical instrument to something so coarse in workmanship that to allow it pattern at all was at best a matter of charity. In the end, these more or less trimmed pieces, numbering 4,468 in all, were separated, according to quality, into three groups. Those of the first quality, showing the classic forms of the Mousterian industry at its best, amounted to 155 perfect specimens, though portions of others that, if intact, would have been equally fine were likewise found in fair abundance. Seeing that the total yield of flint fragments was 15,070, the proportion turns out to be about one first-class implement in a hundred oddments, which is exactly the ratio one expects to find in a Mousterian site.² Next in quality came a considerable number of rougher examples, which made good their claim to embody design by falling naturally into types. Of these there were 2,678. Lastly, there were left 713 still rougher flakes, which, though at first given the benefit of the doubt and included among the shaped pieces, could not finally be retained in the type-series, and must therefore be classed at best as implements of third quality. For all practical purposes these 'atypical' specimens might be counted in with the mere *outils de fortune*; but the fact remains that they were judged to show some faint traces of modelling, representing perhaps for the most part the failures which must ever strew the path of art.

¹ Commont, *op. cit.*, 139. The place of origin of the Jersey flint remains an obscure point. On this subject see my remarks in *Archaeologia*, lxii, 458.

² Cf. *Archaeologia*, lxii, 457 n.

I. *Implements of the first quality.*—These masterpieces of the Mousterian industry in its most typical form would seem almost without exception to be adaptations of the Levallois flake. In other words, most of them were probably struck from a prepared core. Something will be said about such cores later. In the meantime it will suffice to call attention to the typical 'tortoise'-core

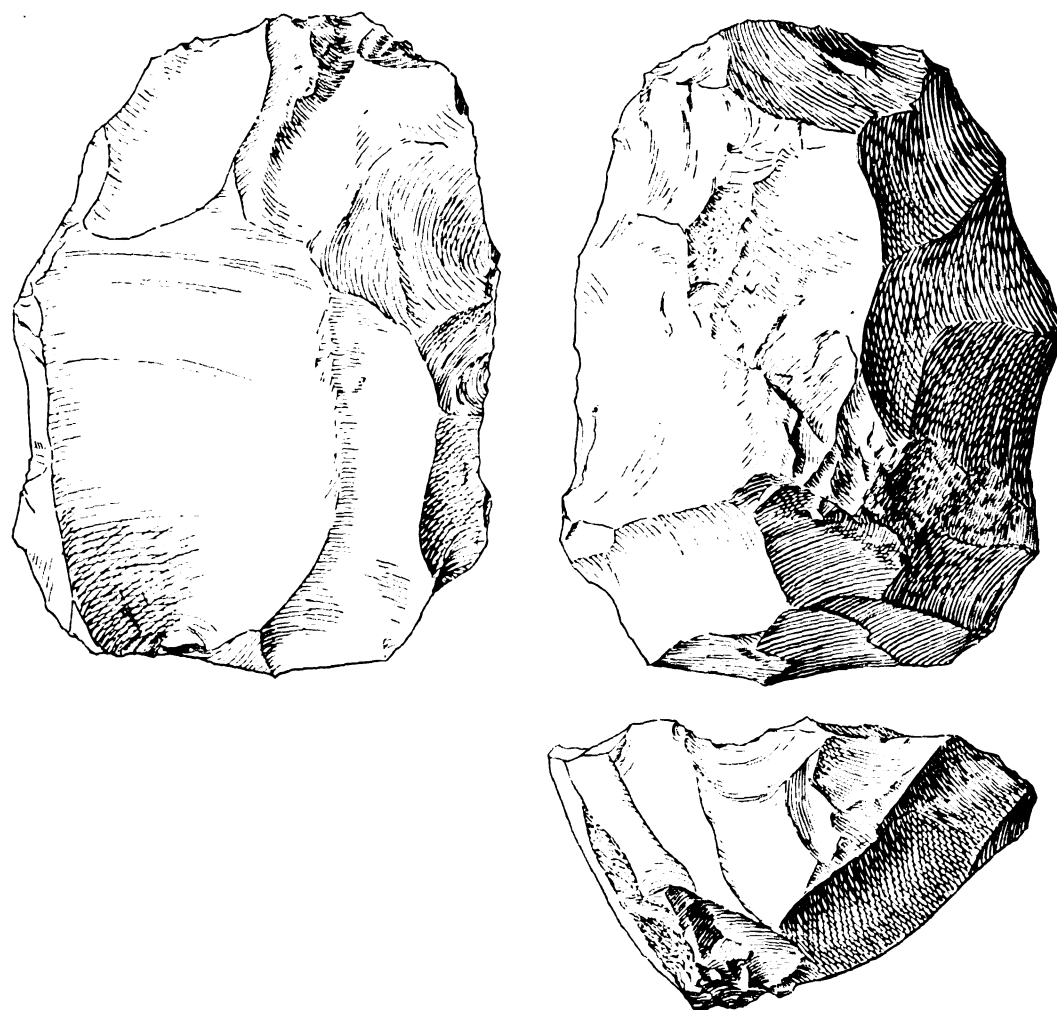


Fig. 6. Tortoise-core. S. J. (8)

(fig. 6), showing on its upper or flatter face the place whence an oval flake has been detached by a blow struck more or less at right angles to the end.¹ This end has been already trimmed square, and the steeply faceted edge of the parent block would furnish a ready-made butt for the derived flake-implement. Such a faceted base, together with a thick and spreading bulb of percussion, is characteristic of the instruments of this highest class. Now, presum-

¹ Cf. R. A. Smith, *Archaeologia*, lxii, 528.



Fig. 7. Ovate flake-
implement. S. J.

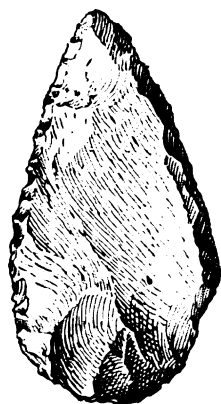


Fig. 8. Pointed flake-
implement. S. J.



Fig. 9. Pointed flake-
implement. S. J.

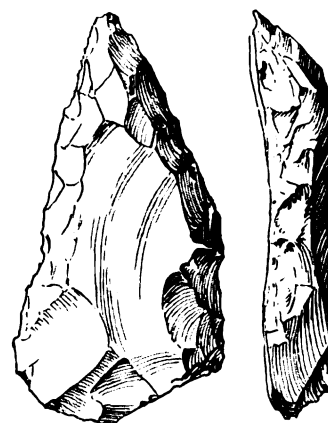


Fig. 10. Pointed flake-
implement. B. M.

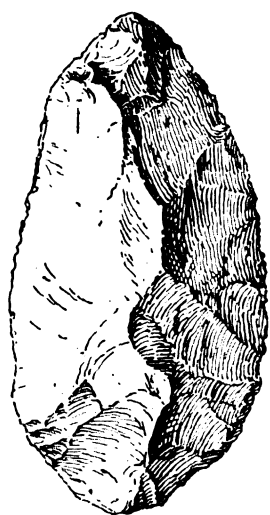


Fig. 11. Ovate flake-
implement. S. J.



Fig. 12. Pointed flake-
implement. S. J.

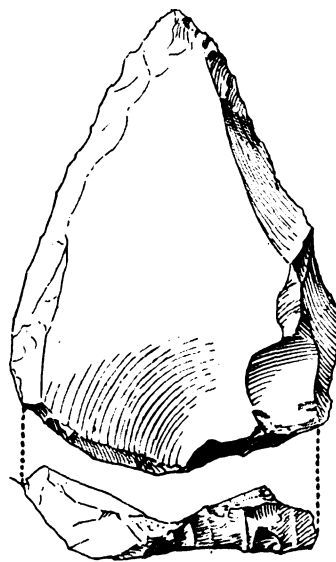


Fig. 13. Pointed flake-
implement. B. M.

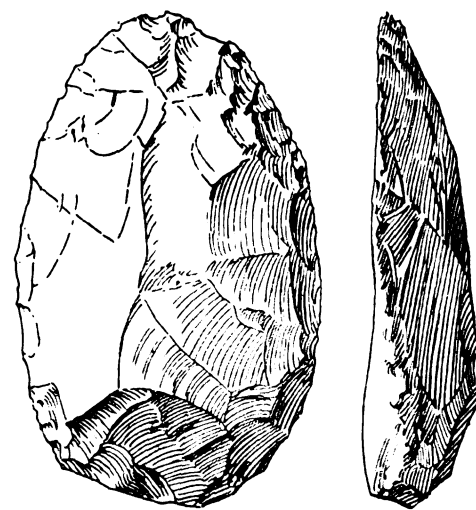


Fig. 14. Ovate flake-
implement. B. M.



Fig. 15. Pointed flake-
implement. B. M.

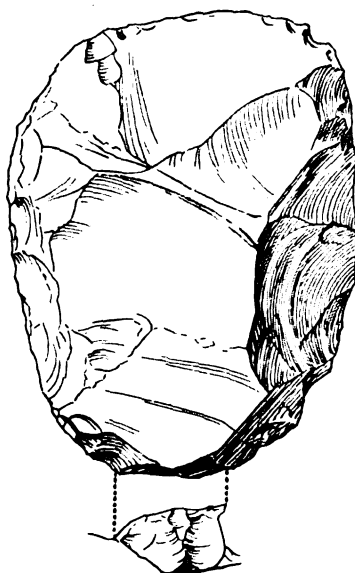


Fig. 16. Ovate flake-
implement. B. M.

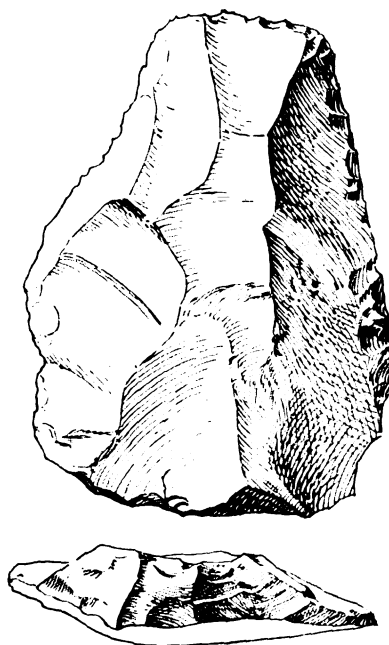


Fig. 17. Flake-
implement with
square end. B. M.



Fig. 18. Knife. B. M.

Specimens of implements of first quality. (3)

ably, such a flake would tend in its original form to be oval rather than triangular. The ultimate shape, on the other hand, must depend largely on the use to which it has been put. On a site where flint was plentiful, even a handy and shapely flake might retain its pristine condition; but not so in Jersey, where, as it has already been shown, they made the most of all they had. Hence secondary chipping abounds, proving frequent re-adaptation as a consequence of hard usage.

Hence, perhaps, the predominance of a pointed shape in the case of these select flake-implements. Out of 155 specimens, 70 run up to a point, though only in 5 cases is this at all sharp; whereas 55 have a rounded top, and the remaining 30 are more or less square-topped. It is a fair guess that such a point was altogether non-functional. Using the faceted butt as a handgrip—and it invariably offers an excellent *surface d'accommodation*, being symmetrically rounded in 43 cases, abruptly squared in 32, and in the remaining 80 tapering off bluntly with two or three facets meeting at a very obtuse angle—the owner of the implement would cut or scrape now with one side-edge and now with the other, either changing it from hand to hand or holding it with the same hand face up and face down alternately. A curved edge would suit well enough for a drawing cut, the force of which must be carried through from the butt-end right to the top. Gradually, however, as this edge wore away it would have to be sharpened by means of secondary chipping. The effect of this would be to reduce the sides so that, while the base remained as broad as ever, they would converge at a more and more acute angle until the characteristic triangular or pointed form was reached. The point itself, however, would serve no useful purpose in the case of a cutting or scraping tool. Only when the top is more or less squared can it be supposed to be functional. Thus, on the one hand, an otherwise oval piece can be so flattened in its curve along the top as to furnish what amounts to a third cutting-edge (fig. 16). Or, on the other hand, an otherwise triangular flake may be sharply truncated, possibly in consequence of an accidental breakage, and may so come to furnish a narrow end-scrapers (fig. 17), if indeed the end be sharpened, as is the case with 15 out of the 30 flake-implements of this type. It remains only to add that these well-finished specimens, like the rest of the implements from this cave, run rather small, the average length being no more than about 75 mm. (3 in.).¹ After all, this follows naturally from the size of the cores, which whether trimmed or untrimmed never touch 6 in. in their greatest dimension.

¹ The scale of relative sizes is as follows: 2 specimens of 130-140 mm. in length, 1 of 120-130 mm., 1 of 110-120 mm., 5 of 100-110 mm., 12 of 90-100 mm., 39 of 80-90 mm., 38 of 70-80 mm., 32 of 60-70 mm., 25 of 50-60 mm.

Implement worked on both faces.—In the course of two years' search only one implement of the best quality was found with a worked under face, if the not infrequent cases of a trimmed bulb be excepted. Another half-dozen pieces, apart from the numerous discs, were found to be worked on both faces, but they were mostly somewhat shapeless. The specimen in question (fig. 19), which measures $115 \times 56 \times 22$ mm., occurred just half-way across the cave, 10 ft. from the entrance, at the very bottom of the bed, where it was only about 4 ft. thick. It is heavily trimmed on both faces, and is evidently a choice well-finished implement. It is, therefore, entitled to rank as a *coup de poing*, though

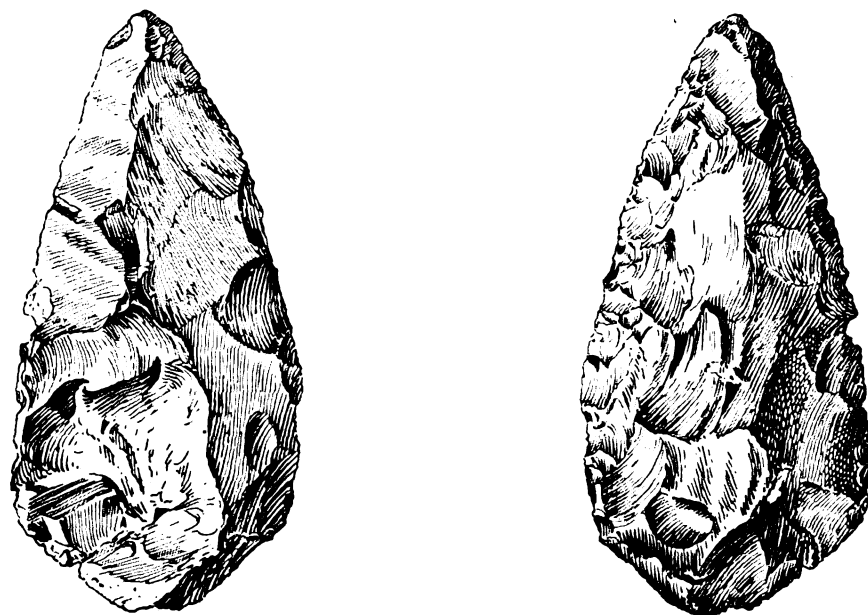


Fig. 19. *Coup de poing* from bottom of bed. S. J. (3)

the tapering sub-oval form is perhaps Mousterian in conception rather than Acheulean. Indeed, one can easily imagine how a Mousterian artist, faced with a somewhat knotty piece of flint such as this is, might for once relax an established rule of operating on a flake with its bulbar face plain. Meanwhile, this single exception serves but to emphasize the fact that such a rule was paramount among the inhabitants of this cave. Judged by this test, which perhaps is not infallible, their industry would seem to be referable to the Middle Mousterian, the earlier stage, supposed to be characterized by a relative frequency of the *coup de poing*, being hardly represented here, though perhaps elsewhere in Jersey.¹

¹ See *Archaeologia*, lxii, 464-6, where I assign the industry of La Cotte de St. Ouen to at least a slightly earlier period than that of La Cotte de St. Brelade. It is true that but one *coup de poing* was found in the former cave, but there are other archaic features, such as the 'cordiform' pattern of the flake-implements and the complete absence of later forms.

- Fig. 6. $125 \times 90 \times 50$. Tortoise-core from which a flake-implement has been struck. The upper face was previously trimmed convex from the edges, and the flakes are truncated by the removal of the finished implement by a blow at the butt. The under face is normally conical, and often retains a patch of crust at the apex, as the only object was to obtain a regular periphery; and the core was on some sites (e.g. Northfleet and Montières) thrown aside as useless after the implement was detached.
- Fig. 7. $73 \times 46 \times 18$. Ovate flake-implement of black flint mottled with grey. Facetted butt. Under face plain and finely worked on both sides. From the top of the bed.
- Fig. 8. $78 \times 42 \times 9$. Pointed flake-implement, very flat and thin, of grey mottled flint, with facetted butt. Under face plain; very finely retouched on both sides up to the point. From the top of the bed.
- Fig. 9. $88 \times 56 \times 19$. Triangular flake-implement of grey mottled flint, patinated white in places and showing iron staining on the underface. Facetted butt; under face plain; well trimmed along both sides up to the point. From the top of the bed.
- Fig. 10. $81 \times 42 \times 12$. Flake patinated in various shades of blue; the butt facetted; under face flat and plain; and both edges carefully worked. Towards the point is a pronounced thickening, the flaking being steeper than usual, and suggestive of Aurignac work. From the top of the bed.
- Fig. 11. $98 \times 51 \times 15$. Ovate flake-implement of grey flint, with facetted butt. Under face plain; secondary chipping mostly along right side. From the top of the bed.
- Fig. 12. $111 \times 61 \times 24$. Pointed flake-implement of grey flint, with facetted butt. Under face flat, the bulb being trimmed with three flakings on the right. Secondary work on both sides up to the point, but heaviest on the right side. From the top of the bed.
- Fig. 13. $92 \times 64 \times 14$. Triangular flake, patinated in shades of grey, with facetted butt and rather steep edge-working; a typical Lc Moustier 'point'. The bulb is prominent and the under face plain; the right end of the butt is almost square, the left is rounded.
- Fig. 14. $97 \times 61 \times 23$. Ovate flake-implement, dove-colour, bulb medium, and bulbar face flat and almost plain, straight platform serving as a butt, the convex face flaked all over and fine work on the edges.
- Fig. 15. $103 \times 48 \times 20$. Black gabled flake, translucent at the edges, with longitudinal ridge not central. Under face flat and slightly trimmed, side-edges somewhat carefully worked and the butt rounded. A rough specimen of the 'point' of Lc Moustier.
- Fig. 16. $95 \times 70 \times 20$. Complete flake-implement, with secondary work all round the edges and a facetted butt with prominent bulb. Under face quite plain, the other boldly flaked. The type of implement produced on the Northfleet factory-site, being Le Moustier man's version of the St. Acheul ovate. Grey to black; quite sharp.

- Fig. 17. $100 \times 72 \times 18$. Pale yellow and somewhat cherty flake with square end, and signs of use there and along the side-edges. The bulb is prominent and that face quite plain; but the butt is faceted in the manner familiar from Northfleet and Montières specimens. The square end is no doubt accidental, but a specimen very similar in all respects from the upper gravels at St. Acheul is figured in *Rev. de l'École d'Anth., Paris*, 1907, 23, fig. 9.
- Fig. 18. $115 \times 45 \times 9$. A broad blade with two longitudinal ribs, and crust along one edge, the other worked like the point. The butt-end with bulb has a faceted platform. Olive-grey patina, the upper end banded.
- Fig. 19. $115 \times 56 \times 22$. *Coup de poing* of elongated, sub-oval shape, of black lustrous flint of a rather 'knotty' composition. Elaborate trimming round the edges and on one face, that on the other face, which is equally convex with the other, being more perfunctory. Found at $10 \times 20 \times 0$, that is, at the very bottom of the bed, which at this point, half-way across the cave and 10 ft. from the entrance, was only 4 ft. thick. This is the only implement of first quality found to be worked on both faces. The form is perhaps Mousterian rather than Acheulean in character.

II. *Implements of the second quality*.—In this category are placed all trimmed flakes showing some typical form other than that of the oval or pointed flake-implement of symmetrical shape and refined workmanship which represents the final triumph of Mousterian skill, being the efficient but economic substitute that drove the *coup de poing* of the earlier periods out of the field once and for all. A certain number of these minor instruments have been shaped and retouched with care, but the majority are somewhat roughly fashioned. For the most part, indeed, they represent forms that must have been suggested by such natural fracture of the flint as took place either when a prepared core was being flaked in the manner already described or else in the course of the previous preparation. It is to be expected, therefore, that under each type will be found examples ranging in the degree of their finish from the perfected to the purely inchoate implement. A purely morphological analysis yields the following series:

A. Long Flakes with two trimmed side-edges:¹

(1) Parallel sides, rounded end	252
(2) Parallel sides, pointed end	143
(3) Subtriangular, rounded end	136
(4) Subtriangular, pointed end	122
(5) Parallel sides, squared end	50

— 703

¹ In categories A to H all implements are above 40 mm. in length.

B. Long Flakes with one trimmed side-edge :

(1) Straight edge, back (<i>i. e.</i> opposite side) parallel	154
(2) Convex edge, back straight	114
(3) Straight edge, back convex	109
(4) Straight edge, back forming projecting angle	81
(5) Subtriangular	20

478

C. 'Square' Flakes :¹

(1) Squared top, three trimmed edges	133
(2) Obtusely rounded top, three trimmed edges	124
(3) Obtusely pointed top, two trimmed edges	91
(4) Squared top, top and one side with trimmed edges	48
(5) One side winged (<i>i. e.</i> projecting outwards from base), three trimmed edges	39
(6) Both sides winged, three trimmed edges	24

459

D. Hollowed Flakes :

(1) Deeply indented	122
(2) Slightly indented	115
(3) Slightly indented, with both sides winged	38

275

E. Curved Flakes :

(1) With slight curve	48
(2) With pronounced curve	12

60

F. Sharpened Flakes

20

20

G. Keeled Pieces :

(1) Long	113
(2) Square	51

164

H. Discoidal Pieces :

(1) One face trimmed flat, other formed by crust	66
(2) Both faces trimmed flat	55
(3) One face trimmed flat, other polygonal	52

173

I. Dwarf Implements :²

(1) Oval and subtriangular flakes (some of the latter curved)	268
(2) Long flakes (some hollowed)	243
(3) Square flakes	206
(4) Sharpened flakes	78

795

¹ 'Square' means merely that length and breadth are approximately equal. See p. 101.² Below 40 mm. in length.



Fig. 20. Small pointed flake-implement.

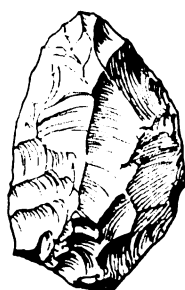


Fig. 21. Small pointed flake-implement.

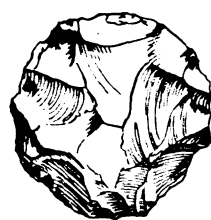


Fig. 22. Disc : both faces worked flat.

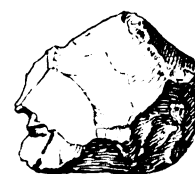
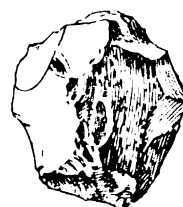


Fig. 23. Core : used as plane ?



Fig. 24. Hollowed flake.

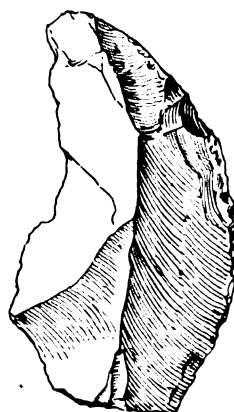


Fig. 25. Curved flake.

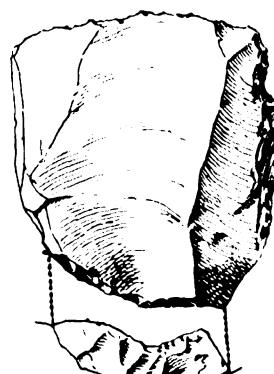


Fig. 26. 'Square' flake.

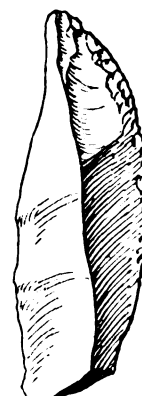


Fig. 27. Long flake, with one side trimmed.



Fig. 28. Dwarf implement: sharpened.



Fig. 29. Dwarf implement: long.



Fig. 30. Dwarf implement: long.

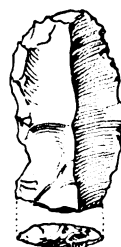


Fig. 31. Dwarf implement: long.



Fig. 32. Dwarf implement: square.



Fig. 33. Dwarf implement: square.

Specimens of implements of second quality. B. M. (3)

K. Broken Implements:

(1) Above 40 mm. in length	.	.	.	.	.	.	.	346
(2) Below 40 mm. in length	.	.	.	.	.	.	.	127
								473
Total (above 40 mm. 2,678, below 40 mm. 922)								3,600

A. *Long two-edged flakes*.—These implements, regarded from the standpoint of pure form, fall into two groups—the oblong and the subtriangular. The former tend to be decidedly elongated, the general ratio between length and breadth being about 5 to 2, though not infrequently exceeding 3 to 1. They may be anything from 115 mm. to 40 mm. long, averaging just 60 mm. The face usually shows a single longitudinal ridge, thus yielding a triangular section. In a few cases this ridge has been partially or even wholly removed by battering, but this feature is so rare that it may be treated as accidental. In the remaining examples a double ridge is usually found. The end of the instrument, whether rounded, pointed, or squared, would seem mostly to be non-functional. Occasional specimens, however, with rounded tops may have served as end-scrapers. There never occurs among those with pointed ends that sharpening by means of diverging blows, directed along the sides from the point, which is characteristic of the later *burin*. Most of these narrow flakes have a sharp cutting-edge, and, in respect of their probable use, might reasonably be classed as blades. It is to be noticed that this type occurred with greater frequency in the upper portions of the thick implementiferous bed along the eastern wall, where there appeared to be the best chance of obtaining stratigraphical evidence.¹ The subtriangular flakes varied in shape from a narrow isosceles to an equilateral form, the general ratio between length and breadth being about 7 to 4. They were anything between 90 mm. and 40 mm. long, with an average of 60 mm. The end, whether pointed or rounded, would not seem to have been functional. From the standpoint of use, the implements of this type are probably to be regarded as double side-scrapers. They are hardly distinguishable, in point of their morphology, from the more pointed examples of the flake-implement; but it may be suspected that, genetically, they differ for the most part, being derived not from the Levallois flake, the standard product of the prepared core, but rather from the by-products of the preparation of such cores. Be this as it may, they are characterized in general by a want of secondary trimming that precludes the possibility of their having started with an oval form gradually reduced by retouching.

B. *Long single-edged flakes*.—The most noteworthy feature of implements of this type—knives, as they might be called in most cases—is that, in addition

¹ See p. 78, and cf. p. 113.

to a trimmed butt, they have a blunt side, or back, opposite to the sharpened edge, thus offering a firm grip for purposes of cutting, scraping, or even chopping. Of the total number of 478, 315 have the edge to the left and 163 to the right when the implement is viewed from above; and, since a right-handed tool would presumably be more popular, one may consequently surmise that such an instrument was normally used with the bulbar face undermost. A straight edge is about three times as common as a convex; but such a result is to be expected from the fracture of the flint when a somewhat elongated flake is given off. The back is probably in most cases due to accident rather than design, being often formed of the natural crust. Where there is a projecting angle on this side one might wonder that it was not trimmed away for the sake of symmetry; but perhaps it was deliberately left in order to afford a grip. Altogether, these long flakes with a back constitute a rough, if distinct, type. They vary in size from 110 mm. to 40 mm., averaging a little under 60 mm.

C. *'Square' flakes*.—The word 'square' in this connexion means simply that the length and breadth of the implement in question are approximately equal. In other words, there occurs frequently a rather stumpy kind of flake of which the transverse lateral dimensions fall on the average between 60mm. and 55mm. The type is well marked (fig. 26). The advantage of such a tool, from the standpoint of use, is that the top-edge comes into play, having enough breadth to render it thoroughly serviceable. Two facts, however, namely that there is normally a pair of well-trimmed side-edges, and that the end is almost as often obtusely rounded as squared, show that the top-edge was not the exclusive or even dominant feature of the instrument, but was rather developed in the course of working with a short side-scraper that lent itself to a sweeping movement such as would finally cause the weight of the hand to press downwards from the butt. Sometimes the result would be merely to break down the edge at the upper angles; whereupon a squat subtriangular form with a more or less functionless end would be produced. If, on the other hand, the instrument projects outwards from the butt so as to form a sort of wing at one of the upper angles, or at both, it may be supposed to be to a corresponding extent somewhat unhandy to use; and indeed this form is relatively so infrequent and so rough as probably to fall short of a truly typical development. It should be noted, however, that there is a tendency in such a winged implement for the edge to wear away between the butt and the upper angles, thus giving rise to a sort of hollow scraper. In the next category to be considered, that of hollowed flakes, 38 such specimens are recorded. Here again, however, it may be doubted whether there has been any conscious attempt to realize a type, since the examples are one and all rather crude.

D. *Hollowed flakes*.—A certain proportion of flakes yielding a concave edge

is likely to occur in the ordinary course of breaking up a flint nodule. Again, the wear and tear along a cutting or scraping surface that was originally straight are apt to cause a more or less notched appearance. Thus it is hard to say how many of the flakes classified on purely morphological grounds under this head were intended as hollow tools. On the whole such evidence of design as would be afforded by careful chipping round the indentation itself is decidedly rare, though by no means wanting altogether. On the other hand, it is plain that, whether skill or good fortune was mainly to thank for their production, such hollowed implements would approve themselves as useful, and thus prepare the way for the more conscious and elaborate efforts of a later period.

E. *Curved flakes*.—Under this head are classed sundry implements of a subtriangular form, ranging from 100 mm. to 50 mm. in length, the pointed end of which slopes away to the right or left. Such a form may be treated as a variety of the hollowed tool, inasmuch as there is bound to be a more or less concave edge on the side to which the beak inclines. If, however, the hollowed side shows careful trimming, and is often much worn with use, the other or convex side-edge is by no means neglected, and may even be the more elaborately worked of the two. Meanwhile, this cannot be regarded as an important type, the instruments showing a well-marked beak amounting to no more than a fifth part out of a total of 60. After all, accident will account for the production of a certain proportion of curved flakes by the side of the straight, and it may be that these were trimmed into two-edged instruments indifferently with the rest without much sense of a special value attaching to the curve as such.

F. *Sharpened flakes*.—Very few of the larger flakes show a sharp projection such as might serve as a drill, and in no case is it certain that special means have been adopted to form a spur, as for instance by notching to right and left of the given point. But among the flakes that measure less than 40 mm. in length there are some far more plausible specimens of the intentionally fashioned drill, so that it is just worth while to mark this off as a distinct type.

G. *Keeled pieces*.—The vast majority of the flakes that have been worked up into implements having the upper face flattish, it seemed better to relegate to a separate category those which rise into some sort of a keel. In such a case the tool might be grasped and guided from above rather than along the blunted surface of base or side, and it would thus be possible to use any part of the periphery for scraping or planing. A sharp-edged butt is not infrequent, and may even be said to be typical of this class. The keel usually takes the form of a ridge, though a domed shape is also found. Well-finished and symmetrical specimens are rare, and it may be doubted whether a genuine type has yet been evolved. On the other hand, in view of later developments, this group of rough tentative instruments is not without a certain interest.

H. *Discoidal pieces*.—The so-called Mousterian disc has always been a puzzle to the archaeologists. As a matter of fact, the type is by no means confined to the Middle Palaeolithic. The fine series collected by Mr. H. Balfour, which is on view at the Pitt-Rivers Museum in Oxford, shows the same form extending from the Chellean down to the Neolithic period in Europe, while it can likewise be matched from Somaliland, the Zambesi, India, North America, and other distant regions. Unfortunately, no primitive people of modern times is known to use an implement altogether similar; so that the function, or functions, of such a type must remain a matter of conjecture. The Mousterian disc has been sometimes regarded as a sling-stone.¹

Apart from the aid of any device for propelling, such as a thong or a split stick, a flattish sharp-edged pebble flung with a rotatory motion would make a formidable projectile. Again, it is possible, though rather unlikely, that some of these disc-shaped implements may have served as cutting or scraping tools. Finally, there is the view that they are prepared nuclei, analogous to the tortoise-core as regards their origin. Thus M. Commont figures certain Mousterian discs which he asserts roundly to be small cores and not throwing-stones at all.²

He notes that his specimens are more or less conical on what he distinguishes as the upper face, and supposes that flakes were struck from the under face so as to produce implements in the ordinary way. There would, perhaps, be no great difficulty in applying this theory to two-thirds of the Jersey specimens, namely, those which have but one face trimmed flat, while the other tends to be conical, or at any rate bulging, either being polygonal in a rough-hewn way or consisting of the natural crust (fig. 34). But when both sides are trimmed more or less flat it is not so easy to regard it simply as a case of a prepared core (fig. 22). In particular, it is hard to see how the smaller examples, measuring, let us say, between 40 mm. and 50 mm., could have yielded a flake worth the trouble of detaching. Thus it must suffice for the present purpose to group these discoidal pieces together without dogmatizing in respect to their origin or function. It should be noted, however, that, if M. Commont's explanation covers all or some of them, the class of cores which is dealt with subsequently³ must be to a corresponding extent augmented.

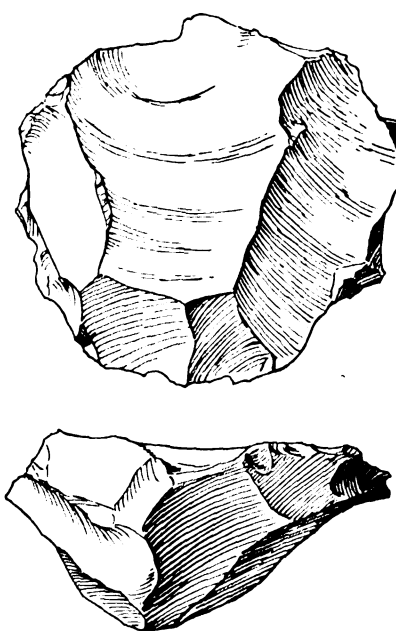


Fig. 34. Discoid core. B. M. (¶)

¹ Compare W. J. Sollas, *Ancient Hunters and their Modern Representatives* (2nd edit., 1915), 167

² Commont, *op. cit.*, 173.

³ See p. 106.

I. *Dwarf implements*.—This expression may be used in a quite untechnical way to describe all implements that are below 40 mm. in length. No mysterious virtue attaches to this precise figure; but it happens to be true of this particular industry that, whereas from about 2 in. (50 mm.) upwards the flake that is fashioned into an instrument tends to be a stoutish piece capable of undergoing any amount of secondary trimming, there occurs as soon as one gets down near 1½ in. another type of implement formed out of a very thin flake that will not stand, and indeed does not need, much working up to get an edge. In the case of these minute pieces, symmetry of outline is the best guide to intentional design, and the share in the result attributable to happy accident is often hard to determine. There are at least two reasons, however, why one should be chary of altogether rejecting their claim to rank as genuine implements. In the first place, there is good reason to think that, flint being scarce and correspondingly valuable, the economically-minded cave-dweller would make the most even of the lesser products of his workshop. Thus out of a total number of 8,860 flakes not exceeding 40 mm. in length which were available, as against 6,210 flakes and cores of a larger size, 4,563, that is, about half, show signs of use, while only 922,² or hardly more than one in every ten, appear to have been worked up into implements. Given the need to exploit his material to the utmost, there is no disproportionate interest manifested in the trimming up of so moderate a quantity of these minor flakes. In the second place, the shapes with which these dwarf implements are endowed are strictly parallel to those displayed by the larger pieces. Thus we have the oval and subtriangular types corresponding in form to those characteristic of the Mousterian flake-implement in its most typical form; next, the long flake, whether a blade with two sharp side-edges, or a knife with one side-edge and a blunted back, which is so common among the larger flakes; and, lastly, the 'square' type with length and breadth approximately equal such as occurs frequently in the other series. Only in one respect does the small flake show an individuality of its own: it almost exclusively provides a sharpened point such as might serve suitably as a drill (fig. 28). In any case, whatever be thought as to the extent to which these scraps of flint have been deliberately fashioned according to a preconceived scheme of types, there can be little doubt that, found as they were in every part of the implementiferous bed, and occasionally in actual contact with pieces of bone, they belonged to the stock-in-trade of the Mousterian household.

¹ The average length and breadth of the four classes are as follows: 268 oval and subtriangular flakes, 31 × 22 mm.; 243 long flakes, 36 × 21 mm.; 206 square flakes, 33 × 32 mm.; 78 sharpened flakes, 35 × 15 mm.

² The broken implements of dwarf size are included in this number.

A dozen or so of these small flakes show a single or even double notch near the base, and it was thought possible by some who found them that they were used as the points of a small missile weapon, whether arrow or javelin.¹ A survey of this dwarf series as a whole makes it very unlikely that this was so. The notched pieces are so few in number, the notches are so slight and accidental in appearance, and the end of the implement as a rule so little suited for piercing, that the view seems hardly worth maintaining even as a working hypothesis.

K. *Broken implements*.—It was thought worth while to set apart the fragments, at any rate the more substantial and trustworthy fragments, of what

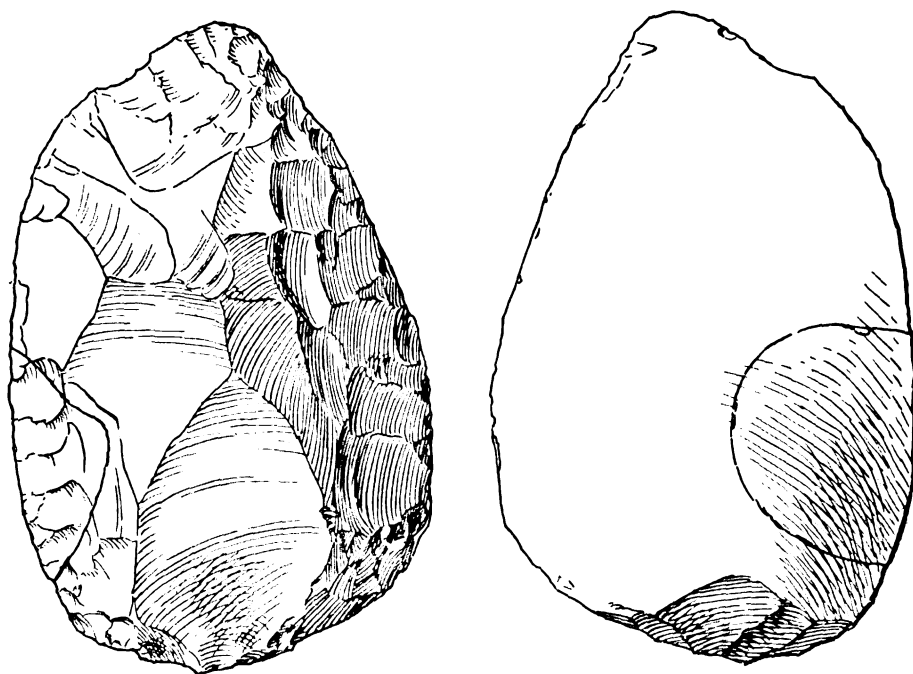


Fig. 35. Flake-implement of first quality, with chip replaced. B. M. (§)

seemed to have been well-shaped implements, in the hope that the missing bits might subsequently be found. As it turned out, it was possible to piece together in this way about a dozen implements of the best quality (fig. 35). The constituent portions occurred more or less widely apart, in one case as much as 12 ft. from each other, always occupying, however, the same stratigraphical position as measured from floor-level. Rarely, if ever, is there any reason to think that the fracture may be modern, more especially seeing that the edges are usually stained with manganese deposit. On the other hand, it is not likely that falls of rock or pressure of the cave-filling—agencies which have apparently done little

¹ Figs. 30 and 31 are average examples. Six of these notched pieces are figured in *Bulletin de la Soc. Jers.*, xl, 68, plate v.

or no damage to the bone embedded in the human deposit—could not merely have snapped these implements in twain but likewise have scattered the fragments over a wide area of the floor. It may be concluded, then, that these breakages were incidental to the production and use of such fragile tools, and one may imagine the broken pieces being pitched away right and left by the user.

III. *Implements of the third quality.*—Concerning these 'atypical' pieces, there is little to add to what has already been said.¹ In most cases the specimen that found its way into this category was one so roughly shaped, if intentionally shaped at all, that it served merely to bridge the typological gap between the implements proper and the merely used flakes. Here and there, however, occurs an example of better workmanship, which nevertheless cannot be brought into relation with the general type-series. It will suffice to cite two instances. The first is that of a long bit of black flint with a high ridge from which the sides fall sharply away, this ridge curving downwards to a point which is slightly depressed below the level of the rest of the flat under face. It is, in short, the 'rostricarinate' form of which so much has lately been heard.² The second is that of a heavy lump of the same black flint trimmed from both faces to a convex edge. Such a tool would make an excellent chopper. Both these pieces were found in the lowest part of the implementiferous bed.

Unshaped material and cores.—Statistics have been given as regards the ratio of used to unused flakes,³ and, apart from the bearing of these facts on the question of economy in the use of the available flint, there is perhaps not much to be gathered from a contemplation of the workshop refuse. In the hope of being able to reconstitute an original nodule, attempts were made to piece the scattered fragments together; but, though in one case as many as four flakes, one of them a well-shaped implement, could be referred to the same core, the nodule was never restored as a whole. The general impression, however, which is left by a survey of the material taken in the mass is that the Mousterian flint-knapper was singularly successful in striking off a long flake with a spreading bulb; though perhaps his cleverness in this respect becomes more marked as one passes to the higher portions of the bed.

The study of the cores affords a good idea of the material at the disposal of the cave-men. The largest nodule is only 140 mm. long and 100 mm. broad, and we find correspondingly that 140 mm. represents the maximum length among the used flakes and 134 mm. among the flake-implements. It is plain that frequent use had to be made of water-worn flint pebbles such as would not yield implements of the better class. A typical pebble of the kind measures

¹ See p. 91.

² This piece is figured in *Bulletin de la Soc. Jers.*, xl, 68, plate v.

³ See p. 90.

82 mm. by 52 mm. (fig. 36). No pebble was quite whole. Some of them, however, are but slightly chipped, and ought, perhaps, to be classed as hammers or pounders rather than as inchoate cores. With the exception of one very perfect specimen of the tortoise-core, and of the discoidal pieces already discussed,¹ the prepared core is not much in evidence. Attention may be called to some thirty examples that are trimmed impartially on all sides so that something like a regular cube results. Such masses would make excellent projectiles, or, wrapped in skin, might serve as 'bolas'. On the other hand, one may see here an attempt to fashion a kind of core-scraper; and there are occasional signs of chipping along the edges that would favour such a view.

There is little to add to what was said in a former paper² about the nature of the flint material as such. Black and whitish-grey flint passing into a grey chert are the chief varieties found, the former being somewhat rarer, and likewise on the whole providing implements of better quality. Banded flint occurs only in a few flakes. A scraper, now in the British Museum, and a beautiful 'point', unfortunately imperfect,³ are of red jasperite, both occurring in the upper part of the bed.

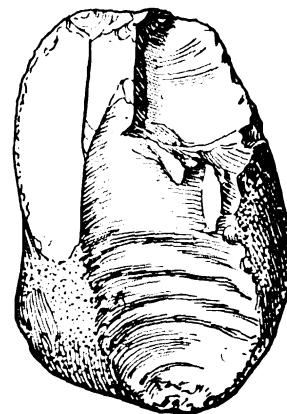


Fig. 36. Beach pebble used as core. B.M. (3)

Fig. 20. 56 × 35 × 8. Black-grey flake, very like fig. 21, with small faceted butt, and careful edge-working all round; a 'point' of Le Moustier type.

Fig. 21. 56 × 35 × 11. Spotted dark-grey flake retaining bulb at butt, and the edges carefully worked all round, the under face being quite plain; a variety of the 'point' of Le Moustier.

These and the following small flakes (figs. 28-33) may be compared with examples of Le Moustier date from La Chapelle-aux-Saints and Les Rebières figured in *L'Anthropologie*, 1913, pp. 621 and 639 respectively.

Fig. 22. 41 × 38 × 12. Greyish-white disc, flaked all over, both faces almost flat, with zigzag edges and slight secondary work. A small specimen of a type common in Late Drift times.

Fig. 23. 32 × 31 × 30. Core-like specimen about the shape of a large walnut, irregularly flaked, but with a flattened face and undercutting at one end, due to sharpening for use as a plane. From this point of view it resembles the carinated plane (*grattoir caréné*) of Aurignac times. Yellowish-grey with patch of crust at the back end. It may be compared with a specimen found in the soil at Barnfield pit, Swanscombe, Kent (*Archaeologia*, lxiv, 192, fig. 17).

Fig. 24. 69 × 26 × 8. Spotted black-grey flake with alternate edge-work on the two faces, and three notches (*encoches*), one deeper than the others; the point is also trimmed alternately.

¹ See p. 103.

² See *Archaeologia*, lxii, 458.

³ Figured, but not very satisfactorily, in *Bulletin de la Soc. Jers.*, xl, 68, plate v. It was found on 20th April 1914, at 18 × 30 × 9.

- Fig. 25. $80 \times 46 \times 15$. Grey flake with lozenge butt and median ridge curving to left near the point. The convex side-edge is carefully worked, but not blunted or battered to form a rest for the finger as in the Abri Audi and Châtelperron points, which it otherwise resembles. It is very similar to one of Le Moustier date from La Bouffia Bonneval (La Chapelle-aux-Saints) figured in *L'Anthropologie*, 1913, 615, fig. 3, no. 4.
- Fig. 26. $57 \times 53 \times 13$. Yellowish-grey flake with facettèd butt and the edges square, the top and right-hand side showing signs of use, if not of trimming. One of a large number of 'squares' found in the cave, and almost identical with a solitary specimen from Grime's Graves, Weeting, Norfolk, illustrated in *Report on Excavations* there in 1914, p. 199, fig. 76.
- Fig. 27. $78 \times 25 \times 9$. Yellow-grey flake with one side thick but untrimmed; the other (convex) side is finely worked, and may be compared with a heavier specimen (fig. 18).
- Fig. 28. $33 \times 14 \times 6$. Creamy-white flake, perhaps a borer, the edge trimmed only along the right side; section of point triangular.
- Fig. 29. $34 \times 24 \times 8$. Broken flake, banded and translucent, yellowish, with crust along one side; the butt is facettèd, and retains the bulb.
- Fig. 30. $33 \times 18 \times 7$. Yellowish translucent flake with rib not central, top end worked, jagged and notched on left-hand side, and small butt facettèd.
- Fig. 31. $32 \times 26 \times 6$. Smoky-black blade with central ridge, signs of use along both side-edges, the notch below being accidental; facettèd butt with bulb.
- Fig. 32. $30 \times 27 \times 8$. Translucent yellowish flake, squared in the style of fig. 26, the upper edge serrated, and the others used on alternate faces; facettèd butt with bulb.
- Fig. 33. $33 \times 27 \times 6$. Opaque black flake, roughly oblong, with slight signs of use all round, and facettèd butt with bulb.
- Fig. 34. $78 \times 72 \times 34$. Irregular disc, grey to black with manganese deposit, resembling a small 'tortoise-core' in the Northfleet style. The under face is convex, a low cone with apex not central, and is flaked all over from the circumference, one small patch of white crust remaining. The flatter face has had a small flake-implement detached, truncating the flaking from the edges. The detached flake had a prominent bulb, and measured about 2 in. by 1.5 in., the diameter of the core being 3 in. Though smaller than most of the Northfleet series, this is by no means the smallest of the type.
- Fig. 35. $128 \times 85 \times 23$. Grey flake-implement with facettèd butt, the latter apparently finished after detaching from the core, which was presumably of the 'tortoise' type. The under face is quite plain; the bulb prominent, but partly trimmed away; fine secondary work on the edges. Good example of the Northfleet type of implement. A good deal of manganese marking, and flake now replaced at side, which was not found in close proximity.
- Fig. 36. $82 \times 52 \times 28$. A beach-pebble used as a core for small flakes, which have been detached from both sides of one face: the toughness of the material accounts for the lack of success in flaking.

(3) *Industry in stone other than flint.*—If flint was scarce in prehistoric Jersey, there was an unlimited supply of the local stone, whether in the form of granite or in that of the greenstone, or diabase, long dykes of which intrude into the rocks of the present coast to the south of Jersey.¹ Nevertheless, such inferior material occupied a quite subordinate place in the economy of the cave-men's life, as the following facts attest:

STATISTIC OF USED STONE OTHER THAN FLINT.

A. Granite series:

Hammers and pounders, with signs of use	237	
Similar pieces, without signs of use	127	
Rubbers	48	
Roughly-trimmed scrapers (doubtful)	48	
	—	460

B. Greenstone series:

Hammers and pounders, with signs of use	172	
Similar pieces, without signs of use	147	
Roughly-trimmed scrapers	75	
	—	394

Total (433 pieces in 1914, 421 in 1915) 854

It will be noted that, whereas the excavations of 1915, though covering a larger area than those of 1914, brought to light only about half as much in the way of flint, they yielded the other kinds of stone in approximately the same quantity. The reason is that 20 ft. to 25 ft. in along the eastern wall, where in 1915 an abundance of burnt bone was found, arguing the former presence of a hearth, there also occurred, associated in the closest manner with the bone, a large number of round pebbles of granite or greenstone such as may well have served to break up the bones, or, again, may have been used as boiling-stones for cooking purposes. Apart from this special conglomeration, the other material showed a distribution parallel to that of the flint. It consisted of rounded water-worn pebbles and sharp-edged flakes.

To deal first with the pebbles, these were clearly introduced by the hand of man, inasmuch as the sterile portions of the cave-filling proved to be wholly lacking in them. They were mostly of rather moderate size, as the following figures will show: Only 13, including a flattish water-worn stone that would serve well as an anvil,² were 120-160 mm. in length; 163 were 80-120 mm.;

¹ A petrologist would doubtless distinguish several varieties of stone in what is here classed as greenstone. One rough scraper, for instance, seems to consist of a hard sandstone such as is found at Alderney. Diorite, too, is not uncommon.

² This was found at 22 x 36 x 8, i.e. near the eastern hearth.

461 were 40-80 mm.; and the remaining 94, including some two dozen minute white pebbles to be considered presently, fell below 40 mm. That many of these pebbles had been turned to account for hammering and pounding was manifest from the battered condition of the surface, while not a few had been broken across either in the course of use, or possibly with intention so as to obtain a sort of flat-faced mallet. Of the rest it is not certain that they may not have been used in many cases for hammering purposes also, as stone so hard would not necessarily display traces of such employment. On the other hand, some show all the signs of having been subjected to great heat, and may well have been brought into play, after the fashion followed by modern savages, in order to boil water or to broil a steak. Finally, one group of pebbles is of great interest as exhibiting patches of polished surface that prove them to have served as rubbers or mullers. The finding of a stone with a rubbed patch on it in 1910 was duly noted by me in a former paper,¹ but the present discovery of quite a large class of these objects allows one to say that grinding operations of some sort, possibly such as were of help in the preparation of roots or grain for food, constituted a staple occupation in these remote times. These rubbed surfaces, which often involve a considerable flattening to the detriment of the natural contour of the pebble, are easily distinguished from the effects of water action as seen on the rest of the stone. Moreover, the cave-man would seem to have selected for his triturating tool a granite pebble of somewhat coarse grain with a rough exterior rather like that of a nutmeg-grater, so that the wear-surfaces are all the more noticeable by way of contrast. The green-stone pebbles, on the other hand, being of fine texture and naturally smooth, have not been put to this use, or at any rate reveal no former function of the kind. A few granite pebbles have slight hollows in them, apparently produced by blows; but whether these were meant to serve a purpose, or are merely the by-product of rough usage, one can but guess. Finally, in connexion with the subject of the pebbles, it is perhaps worth while to take note of the fact that some two dozen very minute pebbles, mostly of white quartz, occurred in the implementiferous bed and nowhere else in the cave. The chances are that they were brought there by the hand of man, but with what object it is hard to say.²

As regards the sharp-edged fragments of stone other than flint that have been provisionally classed as rude scrapers, a sharp distinction must be drawn

¹ See *Archaeologia*, lxii, 465. The stone in question, being both large and flat, was clearly one on which the rubbing was done, corresponding therefore to the quern of a later age rather than to a muller.

² A nest of similar small pebbles was found associated with an interment in the dolmen at Les Monts Grantez, Jersey (see *Bulletin de la Soc. Jers.*, xxxviii, 322), and such a discovery is not without its archaeological parallels in prehistoric Egypt and elsewhere. But it would be rash to found on such a fact a theory that the Mousterian pebbles had a ceremonial value.

between the granite and the greenstone specimens. The former may be pseudomorphs. On the one hand, they recall in outline various types among the rougher flint-implements; they would doubtless be handy enough as scrapers so long as the edge lasted; and they occur side by side with the flint and bone of the implementiferous bed. On the other hand, the cave-filling is largely composed of more or less splintered granite, and it has proved possible to extract a certain number of hardly less plausible examples of these same forms from levels where flint and bone were absent. In these circumstances the granite-scraper, convincing though it seems at the moment of discovery, must be regarded as of doubtful authenticity. The greenstone fragments, however, though they tend to be rather amorphous, have undoubtedly been chipped to a rough edge. In one case it looked as if, helped by the natural cleavage planes of the stone, the cave-man had managed to subject a block of this material to the same flaking process that answered so well where flint was concerned; for it was found possible to fit together three substantial fragments, any of which might have been worked up into a rude scraper. As, however, the pieces in question were found within a yard of each other, and in no case showed marks of chipping along the edge, it is questionable whether the threefold splitting of the block, neat as it is, was not a result of mere earth pressure. It remains to take note of the curious fact that several of the greenstone fragments appear to show a ground, not a chipped, edge. It does not follow, however, that they were ground to an edge with conscious design. Since the granite rubbers prove certain grinding operations to have taken place for unknown, but presumably culinary, purposes, it might well be that an odd bit of greenstone was occasionally used in the same way. At the same time it must be admitted that, whereas chipping produces a poor edge in this material, grinding will achieve the same end far more efficiently. It may be, then, that Pleistocene man made a discovery which he had not the wit to follow up. Not until Neolithic man appears in Jersey is the copious local supply of stone suitable for such grinding turned to good account, while well-worked flint becomes correspondingly rare.

Stratigraphy.—The greatest care was taken to refer each discovery of importance to its exact place in the cave. This was done by dividing the excavated portion into cubic feet, a system which the local conditions made it easy to carry out. If a square of 40 ft. be taken, one side will be found to coincide with the line of the entrance, and the two sides at right angles thereto to coincide hardly less exactly with the side-walls; while the back-line roughly represents the extreme limit of penetration so far as the complete excavation of the implementiferous bed was carried out.¹ On the other hand, floor-level was taken from a bench-mark which was found to hold good so nearly for the whole area

¹ See datum lines given in the plans facing p. 77.

cleared that the base of the human deposit was nowhere found below it or more than 2 ft. above it.¹ Thus there was never any practical difficulty in taking either the horizontal or the vertical measurements from the conventional lines of demarcation; so that, for instance, the formula 20 (feet from the entrance) \times 40 (feet from the western wall) \times 2 (feet from floor-level), which marks the outer and lower limit of the eastern hearth, could be applied almost at a glance by any one familiar with the cave and its principal landmarks.

Nevertheless, though it was thus made possible to compare the relative positions of the various finds, little seemed to result from the comparison so long as the western half of the bed was being considered. Here the deposit was mostly less than 4 ft. thick, and from the lie of the superincumbent débris one got the impression that heavy falls from the north-east corner had to some extent flattened out and displaced the floor-litter along the western wall of the cave. Thus a later implement might well come to rest side by side with an earlier at or near the bottom of the bed.

Prospects improved, however, as soon as the eastern wall was neared. Here the implementiferous deposits were uniformly some 10 ft. thick. Even so, since the implements lay at all angles, it was hard to know how far displacement and rearrangement had taken place. But at last an important clue to the stratigraphical situation was obtained (fig. 37). About 4 ft. to 6 ft. away from this wall, 12 ft. to 18 ft. in from the entrance, and about half-way up the deposit, namely 6 ft. above floor-level, there was noticed towards the end of operations in 1914 a layer, 6 in. to 12 in. thick, composed of whitish gritty, not to say sandy, soil quite destitute of bone or flint.² Here and there a large stone had broken through it, but on the whole it provided a clear line of demarcation between the upper and lower portions of the bed wherever the white band could be traced, namely, over an area of about 12 sq. ft. It was decided to keep carefully apart all the implements from the two levels thus marked off from each other throughout the area in question, so as to be able to obtain a wholesale impression of whatever contrast their several styles of workmanship might present.

The excavations of the next year confirmed the existence of such a dividing line. On 24th July 1915 it became necessary to remove a huge block, weighing some 8 tons, which had hitherto formed a salient between Workings A and C, and had served to prop up the whole of the rearward mass of débris. It came

¹ Exception ought perhaps to be made in the case of the rearward parts of Working A, where along the western wall the bottom of the bed was not easily traced (the finds being somewhat rare and scattered), and may have been in places as much as 4 ft. above floor-level. Cf. *Archaeologia*, lxxiii, 205.

² The sand was very hard, having almost the consistency of sandstone. The late Dr. A. Dunlop, an expert geologist, examined it on the spot, and, having detected in it signs of fine stratification, was of opinion that it had been deposited by an intermittent agency, possibly wind.

clean away without causing for the moment any downfalls of rubbish, and a beautiful section of the cave-filling was thereupon exposed. The same line of whitish soil, hereabouts 1 ft. thick, was seen to run right across the cave for

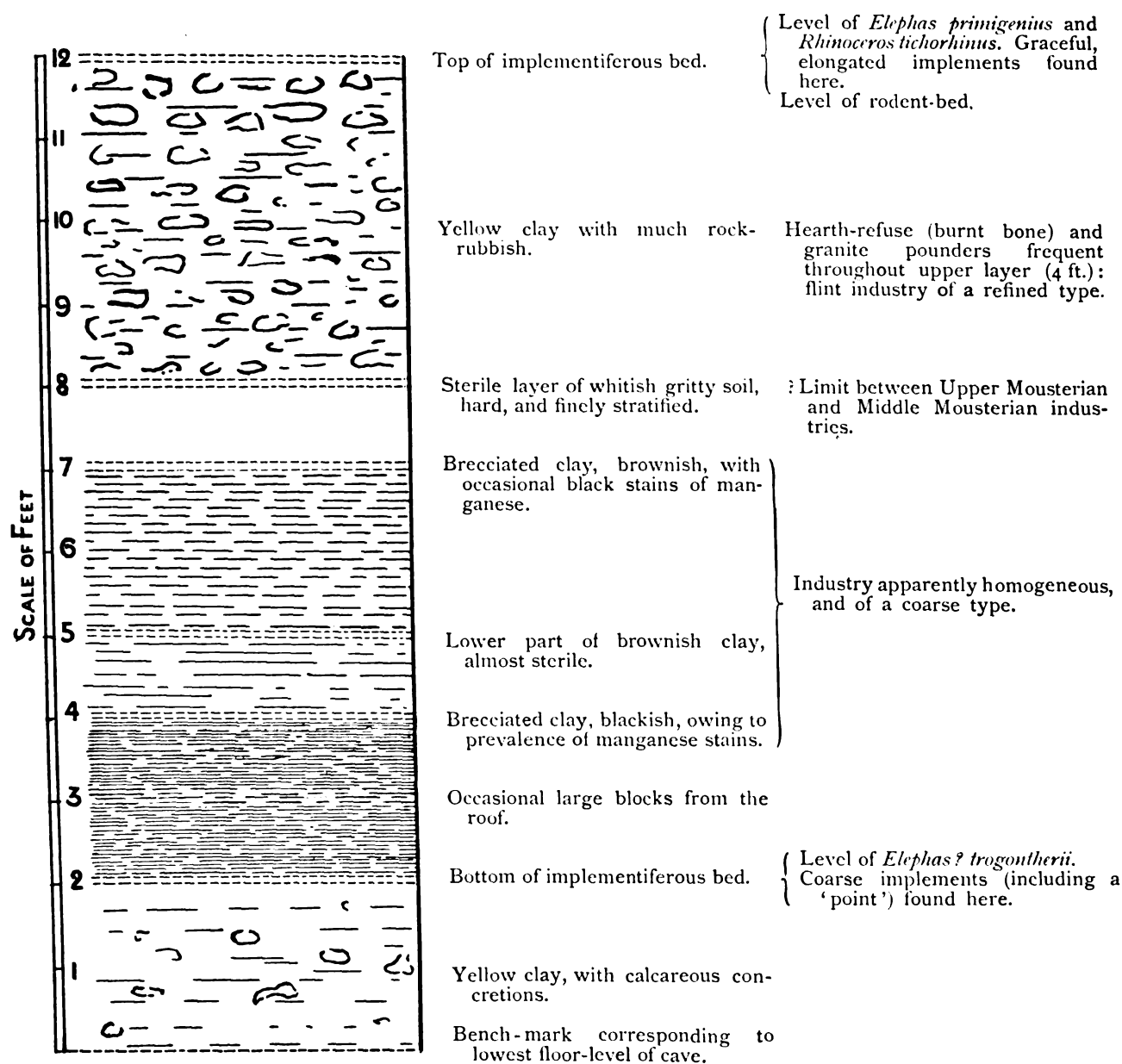


Fig. 37. Synthetic section of implementiferous bed (representing bed near eastern wall about 20 ft. from entrance).

some 20 ft., beginning 17 ft. from the western wall. It was 8 ft. above floor-level at the centre of the cave, and sloped slightly downwards until it was some 2 ft. lower near the eastern wall. It now became plain that below this level the cave-filling everywhere consisted of a compact breccia—so compact, in fact,

that the indurated clay resisted the pick almost as if it were stone. For some 2 ft. above floor-level the breccia was of a black colour, which turned out to be due, not to ashes as one at first supposed, but to manganese staining. Above this the breccia was brownish with but occasional black stains.¹ So much for the stratum or strata below the white band. Above it the débris was comparatively loose, open interstices being visible here and there between the stones, though they rested generally in a magma of yellow clay. The white band showed a wavy line as if it had been pounded by falls from above, but was rarely broken right through by intrusive blocks. The general impression left on the mind was that there had existed a fairly level floor of occupation which lay open to the air for a long period. During this time the disused cave had become thickly strewn with dust and blown sand, while the human deposit below became densely consolidated, perhaps by the agency of water. Later on, a new floor of occupation was established amid débris that was apparently beginning to descend already, since the implements and bone-fragments of the upper layer occur amongst the stones and do not find their way into the white band itself.

Given this stratigraphical clue, however, the resulting conclusions may seem somewhat disappointing. The masses of material from the lower and upper beds were arranged side by side, and carefully studied with an eye to the differentiation of an earlier and a later style. But the prevailing impression produced by the survey was that the workmanship was throughout the same as regards all its leading ideas. As for the differences, they amounted to two. First, the work from the lower bed was decidedly rougher and coarser. Though the oval and pointed types of flake-implement occurred, they were poor in quality; so much so that the choicest museum-pieces came almost invariably from the very top of the upper bed. Secondly, while the typical implement from the lower bed is thick and stumpy, the work of the upper bed is characterized by a general tendency to elongation; the narrow thin blades come mostly from this stratum; the flake-implement itself is more tapering in outline. Altogether, the workmanship, while adhering in the main to the original patterns, renders them in a less ponderous and more graceful way. There is an evolution, but it is an intensive evolution. It is the same industry, but perfected.²

¹ The same succession of a black topped by a brown stratum was noticed in 1914 (see *Bulletin de la Soc. Jers.*, xl (1915), 66), and, since the bottom of the brown layer seemed almost sterile, the finds of the two levels were segregated in the hope that a succession of forms might be detected; but little difference, if any, in the workmanship was to be noticed.

² The contrast will be realized if the two groups of implements drawn by Mr. Barreau are compared. The five lumpish pieces occurred within the same cubic foot at the very bottom of the bed, here about 6 ft. thick, namely, at $20 \times 22 \times 2$, not far from the place where the tooth of *Elephas? trogontherii* was found, namely, $23 \times 22 \times 2$. The five more elegant and finished specimens likewise occurred together within the same cubic foot at $3 \times 37 \times 10$, namely, at the top of the bed, at this point 10 ft. thick.



Fig. 38. Pointed flake-
implement.

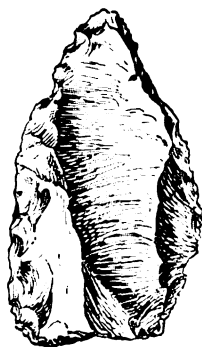


Fig. 39. Pointed flake-
implement.



Fig. 40. Long flake, serv-
ing as end-scraper.



Fig. 41. Pointed flake-
implement.

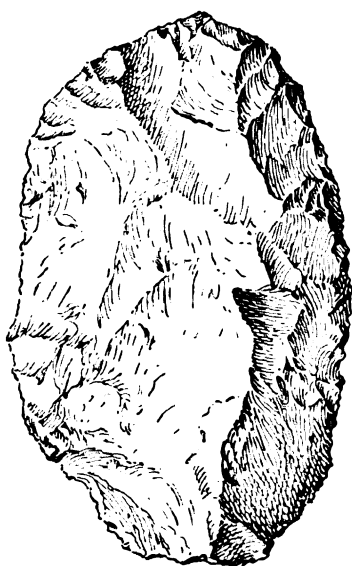


Fig. 42. Ovate flake-implement.

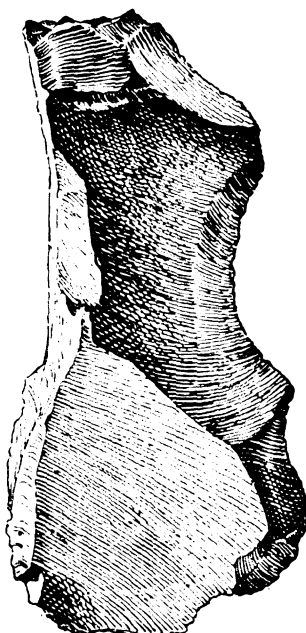


Fig. 43. Hollowed flake.

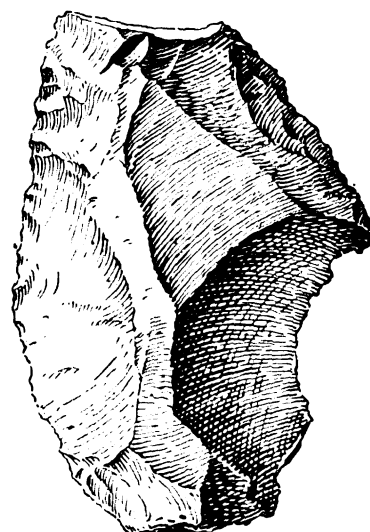


Fig. 44. Hollowed flake.

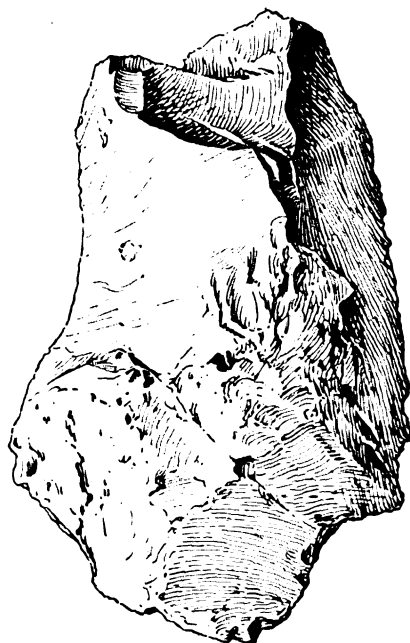


Fig. 45. Rough flake, used.

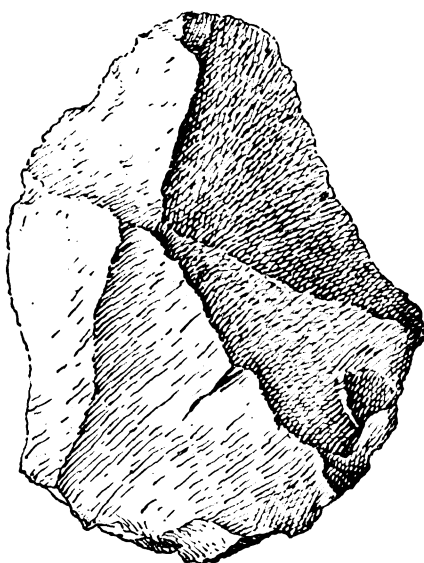


Fig. 46. Rough flake, used.

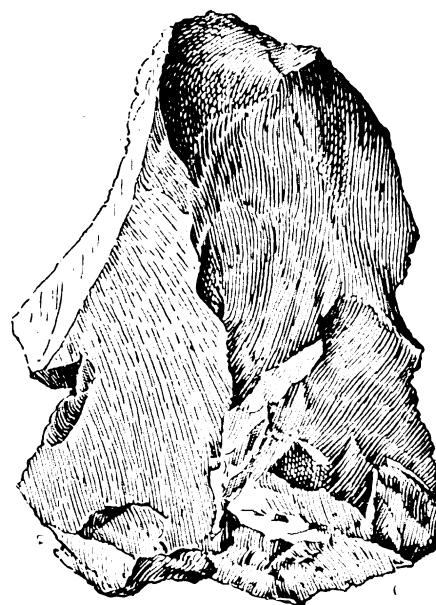


Fig. 47. Rough flake, used.

Five implements (figs. 38-42) from upper, and five (figs. 43-47) from lower, bed ; each set occurring together within one cubic foot. S. J. ($\frac{3}{4}$)

- Fig. 38. $80 \times 50 \times 18$. Pointed flake-implement of lustrous black flint, with faceted butt which is symmetrically rounded. The under face is plain. Both edges are carefully worked up to the point. This implement and the four next figured were found together within the same cubic foot at $3 \times 37 \times 10$, namely, at the very top of the bed along the eastern wall near the entrance. Thus on stratigraphical grounds they may be assigned to the latest phase of this industry.
- Fig. 39. $68 \times 38 \times 14$. Roughly-pointed flake of lustrous black flint mottled with grey; straight platform serving as a butt. Under face plain; sides well worked up to the point. From the top of the bed at $3 \times 37 \times 10$.
- Fig. 40. $133 \times 43 \times 17$. Elongated flake of black lustrous flint, a squared platform providing the narrow butt. Bulbar face plain. Fine trimming along both sides, and carried with rather steepish flaking round the end so as to endow the instrument with the character of an end-scraper. From the top of the bed at $3 \times 37 \times 10$. This instrument is without near parallel among the finds in this cave. It somewhat resembles one found by us in the Paviland Cave, figured by Professor Sollas in *Journal R. Anthropol. Inst.*, xliii (1913), 345, fig. 10, no. 63, and ascribed by him to the Middle Aurignacian.
- Fig. 41. $92 \times 45 \times 14$. Pointed flake-implement of black lustrous flint, with faceted butt. Under face flat, the bulb being slightly trimmed. Fine secondary work on both sides up to the point. From the top of the bed at $3 \times 37 \times 10$.
- Fig. 42. $108 \times 68 \times 15$. Ovate flake-implement of grey flint, with narrow faceted butt. Under face plain; slightly worked along left edge and more elaborately on the right side. From the top of the bed at $3 \times 37 \times 10$.
- Fig. 43. $121 \times 58 \times 24$. Rough flake of black chert, with squared butt. Signs of use on the right side, especially within the hollow. From the bottom of the bed at $20 \times 22 \times 2$.
- Fig. 44. $103 \times 74 \times 23$. Rough flake of black chert, with squared butt. Under face plain. Well used at the sides, and hollowed on the right. This piece and the four following were found together in the same cubic foot at $20 \times 22 \times 2$, namely, at the bottom of the bed, and close to the tooth of *Elephas? trogontherii*. They serve to illustrate the very coarse character of the industry prevailing at this level.
- Fig. 45. $123 \times 77 \times 22$. Rough flake of grey flint from the surface of the nodule, with signs of use on the right side. From the bottom of the bed at $20 \times 22 \times 2$.
- Fig. 46. $106 \times 78 \times 18$. Rough flake of greenstone, with rounded butt, and signs of use on both sides. From the bottom of the bed at $20 \times 22 \times 2$.
- Fig. 47. $110 \times 89 \times 37$. Rough flake of grey flint, with heavy natural butt. Signs of use on the right side. From the bottom of the bed at $20 \times 22 \times 2$.
- Fig. 48. $67 \times 45 \times 16$. Pointed flake of brown-black chert, with butt rounded roughly. Under face plain. Signs of use and slight trimming along the sides. The special interest attaching to this rather coarse specimen of a Mousterian 'point' is due to the fact that it was found in immediate association with the tooth of *Elephas? trogontherii* at $18 \times 23 \times 2$, namely, at the very bottom of the bed, which at this point extended upward from 2 ft. to 8 ft. above the lowest floor-level.

Apart from the evidence afforded by the white belt as a boundary line, the aids to stratigraphy on which reliance can be placed are slight. Patina, however, which for the most part is but barely visible on the flint from this cave, is perhaps able to throw a sidelight on the length of time covered by the Mousterian occupation. Some half-dozen flakes, one of them a first-rate example of the pointed flake-implement,¹ show a double patination. In other words, they have been blocked out in a characteristic Mousterian way, and a thick white patina has been acquired by every part of the flake, including the chipped edges; then more or less elaborate rechipping has taken place which has cut through the white patina and exposed the darker substance of the flint underneath, which in its turn has become slightly dulled by a fresh patination. Now this white patina is uncommonly like that which adorns the flint flakes picked up on the surface of the high lands round the coast of Jersey, and usually ascribed to the Neolithic period. If, therefore, this analogy were to hold—though, unfortunately, the conditions under which patination takes place remain too obscure for chronological inferences to be drawn therefrom with any certainty—one might conjecture that at least 5,000 years had occurred between the first and the second handling of these flakes by men of the same culture.² As, one and all, the examples of double patination were found in the higher portions of the deposit, there is at least a presumption that the artists of the upper bed followed Mousterian precedents that went back over many generations.



Fig. 48. 'Point' found with *Elephas ? trogontherii*. S. J. (3)

Two other facts bear on the stratigraphical question. The first, namely the discovery of an implement worked on both sides near the base of the deposit, does not perhaps take us very far. Even if the instrument in question be classed as a *coup de poing*, it would be rash to conclude on the strength of a single instance that one has got back to the Lower Mousterian, which is supposed to be characterized by the presence of this type.³ The second fact is the finding of a tooth of *Elephas trogontherii*, or some other form of early elephant, at the bottom of the bed, whereas *Elephas primigenius* in association with *Rhinoceros tichorhinus* occurs at the very top.⁴ It certainly looks here as if there was proof of a considerable lapse of time—one, in fact, that amounts to a whole zoological period. Meanwhile, a rough but none the less perfectly

¹ This piece is figured in *Bulletin de la Soc. Jers.*, xl, 68, plate v.

² This conjecture was put forward in our report for 1914 printed in *Bulletin de la Soc. Jers.*, xl (1915), 67. I was glad to hear a suggestion to just the same effect made quite independently by Sir Arthur Evans, President of the Society of Antiquaries, when commenting on a specimen submitted by me to the Society on the occasion of reading the present paper.

³ See p. 95.

⁴ See p. 86.

typical specimen of a Mousterian 'point' occurred with other worked flakes in the immediate neighbourhood of the tooth ascribed to *Elephas trogontherii* (fig. 48). It is hard to resist the inference that these Mousterians of the breccia or lower bed belonged to an epoch far anterior to that of the men of the upper bed.

Fully aware, then, as I am of the uncertainty attaching to considerations based on so imperfect a stratigraphical record, I am inclined to assign the industry of La Cotte de St. Brelade to two periods, probably separated by a chronological hiatus corresponding to the sterile white layer already mentioned. The industry of the first period I assign to the Middle Mousterian. From all I have seen and read of the classical series attributed to this horizon, the work of the breccia-level of this Jersey cave has its natural place here. It is, in fact, the typical industry of Le Moustier itself. The work of the upper bed, on the other hand, I assign to the Upper Mousterian. It is not Aurignacian at all, in my opinion, but nevertheless foreshadows the Aurignacian industry in a number of ways.¹ There are particular implements, though in no sense typical ones, that closely resemble Aurignacian forms as regards their outline; but the trimming is Mousterian, not Aurignacian, in its technique, the perpendicular 'retouch' of the later epoch being almost wholly absent.² If these opinions stand the test of further examination—and I trust that many of those competent to criticize will be led to study for themselves the copious material stored in the museum of the Société Jersiaise—La Cotte de St. Brelade is entitled to rank as a pure Mousterian site, as rich and representative in its way as almost any in Europe.

¹ I had the good fortune, when assisting Professor Sollas to excavate the Paviland Cave (see W. J. Sollas in *Journal of the Royal Anthropological Institute*, xliii, 325 f.), to handle Aurignacian implements in the mass; and, for comparative purposes, the composite impression thus gained tends to be more helpful than the study of endless books or museum cases where the selected instance predominates.

² I was able to pick out in all a dozen pieces showing a slight tendency towards perpendicular chipping, most of them being thick flakes that could not well be made to yield an edge in any other way. Fig. 10 affords a fair example of such chipping. Figs. 23, 24, and 40 may also be cited as in other respects approximating to Aurignacian types.

V.—*The Feast of the Five Kings.* By CHARLES LETHBRIDGE KINGSFORD, Esq.,
M.A., F.S.A.

Read 18th May 1916.

IN the winter of 1363-4 three foreign kings came to England and were entertained by Edward III in London, whilst a fourth had also intended to come. It was a sufficiently remarkable event and as such was duly recorded by the chroniclers of the time.¹ A civic legend has long passed current that all the four foreign kings and Edward III were present together at a banquet given by Henry Picard, a vintner and sometime mayor of London. The Feast of the Five Kings has accordingly been commemorated in the painting by Mr. Chevalier Taylor, presented to the Royal Exchange by the Vintners Company.

In its popular form the story seems to be no older than the *History of Edward III* by Joshua Barnes, which was published in 1688. Barnes relates that Henry Picard made a splendid feast: 'at which entertainment were present the kings of England, Scotland, France, Denmark, and Cyprus, the Duke of Bavaria, the Chief Hostages of France and King Edward's sons (excepting the Black Prince then in Aquitaine) and many of the chief nobility of England.'² The ultimate source of Barnes's narrative was John Stow's *Annales of England*, under the date 1357. I will therefore first give the story as the old antiquary himself told it:

Henry Picard, Vintner, Mayor of London, in one day did sumptuously feast Edward, King of England, John, King of France, the King of Cipres (then arrived in England), David, King of Scots, Edward, Prince of Wales, with many noble men and other, and after the said Henry Picard kept his hall against all commoners whosoever, that were willing to play at dice and hazard. In like manner the Lady Margaret his wife did also keep her Chamber to the same intent. The King of Cipres, playing with Henry Picard in his hall, did winne of him fifty marks; but Henry, being very skilful in that arte, altering his hand did after win of the same king the same fiftie marks, and fiftie marks more, which when the same king began to take in ill part, although he dissembled the same, Henry said unto him: My Lord King be not aggrieved, I covet not your gold but your play, for I have not bid you hither that I might greeve you, but that amongst other things I might trie your play, and gave him his money againe, plentifully bestowing of his own amongst the retinue: besides,

¹ *Chron. J. de Reading*, p. 158, ed. J. Tait (apparently the original); *Eulogium Historiarum*, iii, 233 Higden, *Polychronicon*, viii, 362; Knighton, i, 118; Walsingham, *Hist. Angl.*, i, 299.

² Barnes, *Hist. Edward III*, p. 635.

he gave many rich gifts to the King and other nobles and knights, which dined with him, to the great glorie of the Citizens of London in those dayes.¹

Stow gave the story somewhat more briefly in his *Survey of London*,² but there put it under date 1363, realizing that 1357 was at all events impossible. The error had no doubt arisen from the fact that 1357 was the year of Picard's mayoralty. Barnes adopted the better date, and added the names of some persons whom he thought might have been present, together with the king of Denmark, thus making up the number of the five kings. On the other hand, he was careful to omit the Black Prince, whom he knew to be absent in Aquitaine in 1363.

The only other printed note of the feast is contained in a short summary of a cartulary of Westminster Abbey, which was published over seventy years ago by Samuel Bentley,³ the editor of the interesting historical collection called *Excerpta Historica*. This reference led me to suppose that the original of Stow's narrative might be found in the muniments of Westminster Abbey, to which it is clear from sundry references in the *Survey* that Stow had access. By the courteous assistance of Dr. Armitage Robinson, then dean of Westminster, this original was found in the volume known as the *Liber Niger*. It was at once obvious that Stow had done no more than translate verbatim from the Latin of the Westminster record, adapting also therefrom the impossible date 1357.

The most ancient, and probably the original, of the fourteenth-century notices of the visit of the king of Cyprus to England is contained in the Chronicle of John de Reading, then a monk of Westminster. It is somewhat curious that Reading did not make use of the story of the feast in his chronicle, but it is nevertheless possible that it is part of the material collected by him. The *Liber Niger* itself is a compilation which was made from older documents under the direction and at the expense of Thomas Clifford, a monk of Westminster, not later than 1485. Thomas Clifford is several times quoted by Stow as his authority for events of Westminster history.⁴ But Stow's reference is obscure, and I am indebted to our Fellow Mr. Lethaby for the clue which led to the partial solution of the problem. I say 'partial' because the *Liber Niger* does not seem to be the source of all the statements attributed to Clifford.

Thomas Clifford himself has a brief but romantic history, which deserves to be recorded. The *Liber Niger* contains the following statement :

Liber quaternus niger ex antiquo denominatus, quem Thomas, dominus Clifforde, vir honorabilis, ac huius monasterii beati Petri Westm. quondam monachus, ad suos

¹ P. 415, ed. 1605.

² *Survey*, i, 106.

³ P. 43: 'De Henrico Pycard vinetar. London. qui splendide ac honorifice conviviavit Regem cum aliis Regibus. 31 E. III.'

⁴ *Survey*, i, 82; ii, 102, 105.

sumptus expensasque fieri fecit de nouo in tempore Reuerendissimi patris et domini, Domini Johannis Estney, permissione diuina prefati monasterii abbatis prestantissimi.¹

Estney was abbot of Westminster from 1474 to 1498. Thomas Clifford first appears in the records of the Abbey in the Chamberlain's roll for 1463-4. He sang his first mass in 1466-7, was keeper of the lady chapel before 1483, became treasurer in that year, and seems to have died in September 1485. His description of himself as 'dominus Clifforde, vir honorabilis', is peculiar for a monk. 'Dominus' here seems clearly to mean something more than 'Dan' Thomas, and taken with 'vir honorabilis' suggests that Thomas belonged to the noble house of the Cliffords. Dr. Robinson suggests that he was a son of Thomas de Clifford, the eighth lord, who was killed at St. Albans in 1455. That lord is usually stated to have had four sons—John, Roger, Thomas (who is stated to have married four times but to have died without issue) and Robert.² This identification is therefore impossible unless it is supposed that there was a fifth son and second Thomas. But that some member of the Clifford family should have sought sanctuary at Westminster in the early years of Edward IV is not unlikely. Henry, son of John Clifford the ninth lord, after his father's death at Ferrybridge in 1461, was according to a sixteenth-century legend brought up as a shepherd on the family estates and only restored on the accession of Henry VII. I have, however, wandered too long from the main story in this endeavour to trace its provenance.

The story will be best discussed by giving some account of the chief actors in it. And first of the host at the feast. Henry Picard, as already stated, had been mayor in 1356-7. His name suggests a foreign origin, and is likely enough to have been used in London by persons who were in no way related to one another. There was a Richard Picard, who was sheriff in 1260-1, and was perhaps father of one Joyce le Picard, owner of a tenement in St. Leonard, Eastcheap, in 1282.³ About the same time there was a John Picard, 'barbor', who used to go playing dice in taverns after curfew, contrary to the statutes of the city.⁴ I will not venture to suggest that the skill of Henry Picard in that art was due to descent from this disreputable person. John Picard, 'barbier', appears as late as 1319, and may be the John Picard who founded a chantry at St. Mary Conyhope in 1323.⁵ More likely relatives are Arnald Picard, who was admitted a broker of wine in 1309, or Peter le Picard, a merchant stranger, who defrauded the king's custom over the sale of a cargo of large nuts in 1315.⁶ However, we know nothing about Henry Picard till he appears as witness to

¹ Dean Robinson, *Westminster Abbey Manuscripts*, p. 97.

² Whitaker, *History of Craven*, p. 311.

³ *Letter-Book*, A, p. 154.

⁴ *Letter-Book*, B, p. 7.

⁵ *Letter-Book*, E, p. 110; *Cal. Wills in Court of Husting*, i, 305.

⁶ *Letter-Books*, D, p. 220; E, p. 42.

a deed on 19th May 1345, in the excellent company of Sir John de Pulteney.¹ In the following year he appears in a list of citizens assessed as having goods and chattels to the value of more than £10.² This hardly affords a safe indication of the extent of Picard's wealth, for Sir John de Pulteney, by his will dated 14th November 1348, directed that Henry Picard should have the refusal of his great mansion 'The Coldharbour', at the price of one thousand marks.³ Picard was then one of the sheriffs, and soon afterwards became alderman of Bishops-gate Ward. He had married Margaret, grand-daughter of Sir John de Gisors, a wealthy merchant of the Vintry, who had been mayor three times many years before. Gisors in 1351 bequeathed to Henry Picard and Margaret his wife all his lands and tenements in the parish of St. Martin in the Vintry.⁴ Stow writes thus :

over against St Martins Church, is a large house builded of stone and timber, with vaults for the stowage of wines, and is called the Vintrie. There dwelled John Gisors, Vintner, Mayor of London, and Constable of the Tower, and then was Henry Picard, Vintner, Mayor. In this house Henry Picard feasted four kings in one day.⁵

The position of the Vintry was on the south side of Thames Street, between Three Cranes Lane and Church Lane. After Picard's death it came into the possession of Sir John Stodie, another vintner, who gave it to his company. Vintners' Hall now stands on the site. Picard being thus well-housed and wived was become a person of great wealth and importance, for the vintners were amongst those who derived most profit from the trade with Gascony. That he should have been chosen mayor in 1356 was his natural reward. He was no doubt very well able to have given the sumptuous feast for which he is now best remembered. His will, dated 3rd July 1361, was proved on 25th July 1365.⁶

Now we come to the guests, and first of the king of Cyprus. This was Peter de Lusignan, who had succeeded his father in November 1358. He was a romantic prince of an eccentric genius, who had formed great schemes for a new crusade, which were far beyond the means of his little kingdom. With the hope of enlisting the princes of the West in support of this project he came to Europe at the end of 1361. He spent over a year in the cities of North Italy and in the Papal Court at Avignon. The cities entertained him handsomely, and Pope Urban gave him a bull commending his scheme. Thus fortified he went to try his fortunes amongst the princes of Germany, and spent the summer of 1363 journeying up and down the Rhine. But neither in Germany, where there was much feasting, nor in Paris, where there was much talking, did King Peter get any promise of practical value. With the hope of better success in England,

¹ *Letter-Book*, F, p. 121.

³ *Cal. Wills*, i, 610.

⁵ *Survey*, i, 239-40.

² *Ibid.*, p. 143.

⁴ *Ibid.*, i, 644.

⁶ *Cal. Wills*, ii, 89.

then rich and warlike after the glories of Crécy and Poitiers, he next journeyed to Calais. There he had to wait some time for favourable weather, but at last crossed the Channel and landed at Dover on 2nd November.¹

On the 6th day of November (writes a contemporary English chronicler) the King of Cyprus came to London, bringing with him as a prisoner a pagan king of Lecto, and also another great lord, likewise a pagan but not a prisoner, who was called the Lord of Jerusalem. This latter was converted to the Christian faith, and received at the holy font by the King of England, who called him after his own name Edward. On the Monday next after the coming of the King of Cyprus the King of Scotland came to London to treat with the King of England on certain causes touching himself. So before the end of the Parliament there were five kings present in London, though they were not all summoned to the Parliament. Such a thing had never been since the time of King Arthur, for whose feast at Caerleon six kings were present, with himself as seventh, and all of them were tributary unto him.²

The first question that occurs to one in this narrative is, who were the 'Rex de Lecto' and the Lord of Jerusalem? It is tempting to find the solution in another passage of the same chronicle, which relates that in 1364 there was

a mortal battle between the Christians and pagans, where were present of Christian princes John, King of Hungary, who hath no peer for goodness in all the world, Siward, King of Gorgonia, the Master of the Hospital of the Island of Rhodes, and a great host of Christians; of the pagans who were killed there were counted 40,000 and many more who were not counted; of the Christians there were five thousand and two hundred and ten; and there were 15 pilgrims and nine knights and squires captured and imprisoned in the castle of Chaundelour. The battle took place in the plains of Turkey, and there were these princes of the pagans, the Soldan of Babylon, the King of Turkey, the King Baldax, the King of Belmary, the King of the Tartars, the King of Lecco.³

This narrative is interpolated in an account of the earthquake at Rhodes in April 1364, which was told to a monk of Malmesbury by Sir Richard Chastel-layn. F. R. Haydon, who edited the chronicle fifty years ago, thought that the battle referred to was the one in which the Turks defeated the Christians under the walls of Adrianople.⁴ But the true date of that battle was in 1371, and the plains of Turkey must at that time have meant some place on the Asiatic side. Moreover, Chaundelour must mean Alaia, on the gulf of Satalia, which the eastern Franks called Candelore. Now Peter de Lusignan had captured Satalia in August 1361, and if we could suppose that the alleged battle was an echo of that victory, we might suppose that the king of Lecco was one of Peter's prisoners and the same as the king of Lecto, whom he brought to England two years later. But though some knights from the West fought under Peter at

¹ N. Jorga, *Philippe de Mézières*, ch. vii.

² *Eulogium Historiarum*, iii, 233.

⁴ *Ibid.*, iii, p. xlv.

³ *Ibid.*, iii, 238.

Satalia, there was no such assembly of Christian and pagan princes there as the chronicle alleges. Moreover, this chronicle is for the most part based on the Westminster Chronicle of John de Reading, who simply records that there was a battle in the parts oversea without giving any detail.¹ So one is driven to the conclusion, put forward by Professor Tait, that either the good monk of Malmesbury had been wofully hoaxed by Sir Richard Chastellayn, or that, finding the baldness of his original dull, he had padded it out with the names of all the pagan princes he had ever heard of.

A more possible solution is that the 'Rex de Lecto' means king of Lithuania. It so happens that Waydot, son of King Keinstut of Lithuania, had been captured by the Germans at Kauen in April, 1362. He may have been given as a present to King Peter, or it may be that his captor himself came to England in Peter's company. However, this is pure conjecture; for all that we know about Waydot is that three years later he turned Christian and fought against his father on the side of the Germans.²

As for the lord of Jerusalem we are still more in the dark, but he was presumably some dusky gentleman whom King Peter had picked up in the East.

Having thus disposed of the two pagan kings, let us return to Peter in England. Froissart relates that the king of Cyprus rode to London from Dover by easy stages. On his way he was met by the earl of Hereford, Sir Walter Manny, the lord Despenser, Sir Ralph de Ferrers, Sir Alan de Buxhull, Sir Richard de Pembridge, Richard Stury, and many others, who escorted him to his hostel in the city.

I could not tell you in a whole day the tale of the noble dinners, suppers, feastings and rejoicings, of the gifts, the presents and the jewels that were bestowed on the gentle King Peter of Cyprus, more especially by the King of England and Queen Philippa his wife. And well it was that they did so, for he had come a long journey to see them and for to beg and pray King Edward to take the red cross, and help open the passage upon the enemies of God. But the King of England excused himself well and wisely, and thus spake unto him: 'Certes, fair cousin, I have a good will to go on this voyage, but I am too old, and I shall leave it to my sons. I think that, when the voyage be open, you will not make it alone, for the knights and squires of this land will serve you readily therein.' 'Sire,' answered the King of Cyprus, 'you say enough, and well do I believe, and you permit them, that they will come for to serve God and advance themselves, for the knights and squires of this land are ready to toil and travel.' 'Yea,' said the King of England, 'I will never dissuade them, if other needs, which I do not foresee, hinder not me and my kingdom.'

Never could the King of Cyprus obtain ought further of the King of England, nor more assurance for his voyage; nathless was he loyally feasted with dinners and great suppers. And it fell at this season that the King David of Scotland had need to come into England to King Edward. And when upon the way he heard

¹ *Chron. J. de Reading*, pp. 308-9.

² Jorga, *Philippe de Mézières*, pp. 178-9.

that the King of Cyprus was in London, he hasted and made him ready to seek him. And the King of Scotland came unto London ere that other was departed. So they greeted one another and rejoiced greatly together; and the King of England entertained them twice at supper in the palace of Westminster. Then the King of Cyprus took his leave of the King of England and of the Queen, who gave him at his departure great gifts and fair jewels. And the King of England gave unto the King of Cyprus a ship that was called *The Katherine*, very fine and large. Now the King of England had had her built to pass in her over-sea to Jerusalem; and the price of this ship was 12,000 francs, and she lay then in the harbour of Sandwich. For this gift the King of Cyprus thanked the King of England very heartily. After this he tarried a short time, being desirous to return unto France. Yet over all the King of England defrayed all the charges of the King of Cyprus and his people in going and coming to his kingdom. But as for the ship I know not what became of her, for two years afterwards I saw her still at Sandwich, and none could tell me the reason. For my part I believe that the King of Cyprus left her there, by reason of the charge that he would be at to do ought else with her.¹

Whilst Peter was in London he was entertained with a great tournament in Smithfield shortly after St. Martin's Day. For this occasion King Edward gave him an aventail.² After spending a month to such small purpose King Peter left England about the beginning of December. On his way through Kent he was robbed of all his goods by brigands. The criminals were brought to justice at London.³ But if Peter obtained no other compensation he may have left the country a poorer as well as a sadder and wiser man than when he came to it.

In France Peter spent some time with King John at Amiens, reached Paris by Christmas, and thence went on to try his fortune with the Black Prince at Bordeaux.

We will now turn to the other kings. David of Scotland, who was always glad of any excuse for a visit to London, arrived on 13th November in good time for most of the festivities in honour of the king of Cyprus. He stayed on for three months on his own account, but must have left London in the latter part of February, since he was back at Scone on 16th March.

John of France, as we have seen, received King Peter at Amiens in December 1363. He was already intending to go to England in the discharge of what he conceived to be a point of honour. His son, the duke of Anjou, who was hostage for him in England, had broken his parole, and John, thinking his own honour was compromised thereby, determined in spite of the remonstrances

¹ Froissart, vi, 90-2, 280-4, ed. Luce.

² 'Regi de Cypre pro hastiludio facto in Smethefeld post festum sancti Martini anno xxxvijº de dono Regis Anglie j Auentaill de acere per breve Regis de privato sigillo dato primo die Novembris eodem anno: per quod Rex mandat dicto custodi quod prefato Regi de Cypre j auentaill de acere pro hastiludio in Smythfeld de dono Regis liberari faciat.' Wardrobe Account, 37-38 Edw. III, *Exchequer L. T. R.* 4, m. 9, P. R. O.

³ *Chron. J. de Reading*, p. 158.

of his nobles to return to captivity and make excuses for his son. He landed at Dover on 4th January 1364, and rode through Canterbury to Eltham, where he stayed some days. On 14th January he was received with much honour by the mayor and citizens at London, and went to reside at the Savoy. There during two months he was entertained by King Edward and his sons. But after a while he fell ill and died in the Savoy Palace on 8th April.¹

The fifth of the supposed kings was Waldemar IV of Denmark, who was, it is true, anxious both to meet Peter of Cyprus and to visit England. For the latter purpose he actually received letters of safe-conduct on 2nd February 1364. But if Waldemar ever came to England, which is unlikely, he certainly did not do so on this occasion. He had indeed left Denmark about the end of October 1363, but it was on a visit to Germany. He was with the emperor at Prague on 2nd January 1364, and thence travelled by way of Cologne to Strasburg, where he arrived on 26th February.² It is thus quite clear that Waldemar cannot have been present with Peter of Cyprus in England in November 1363, nor have arrived very long before the death of John of France. As a matter of fact, the king of Denmark does not figure in the story before Barnes wrote in 1688. Barnes, no doubt, knew of the intended visit, and finding the statement that there were five kings present in England at once, put him in to make up the number.

And now for the truth of the story. It is quite clear that there cannot have been present at Picard's feast more than three genuine kings. If Peter was one of them the date must have been after David's arrival on 13th November and before the end of the month. The traditional five may in that case be restored by including the king of Lecto (or Waydot of Lithuania) and the pagan lord of Jerusalem. This will fit the persons of the story best, and these are clearly the five kings intended in the only contemporary chronicle which gives that number. On the other hand, it is tempting to find in Picard's feast, when he kept hall for all comers to play at dice and hazard, an allusion to some Candlemas merry-making, at which season Stow tells us 'there were fine and subtle disguisings, masks, and mummeries, with playing at cards for counters, nails and points in every house, more for pastime than for gain'.³ But if the feast was at Candlemas Peter of Cyprus was not present, and there could only have been three kings instead of the traditional five, and we should then be forced to conclude that King David was the original Scot, who was distressed when 'bang went saxpence'.

¹ Froissart, vi, 94-9.

² Jorga, *Philippe de Mézières*, pp. 163, 186.

³ *Survey*, i, 97.

VI.—*The Hal-Tarxien Neolithic Temple, Malta.* By PROFESSOR T. ZAMMIT,
C.M.G., M.D., Curator of the Valletta Museum.

Read 29th June 1916.

THE discovery of this important neolithic temple enriches the unique series of Maltese monuments and, besides demonstrating afresh the importance of the Maltese Islands in prehistoric times, sheds a flood of light on the other monuments so far discovered.

The site on which the monument was raised is not very far from the Hal-Saffieni Hypogeum and the Cordin stations, which may well be considered to be upon the same plateau.

The Cordin plateau, from the line of cliffs overlooking the Grand Harbour at Ras Hanzir, rises insensibly but continuously towards the south-east.

The Hal-Saffieni neolithic village, in the centre of which the hypogeum was excavated, lies on the south-west limit of this plateau, which slopes rapidly towards a narrow valley.

About half a mile to the north-east of Hal-Saffieni, on the way towards the village of Tarxien, one reaches the top of a flat hill which is known as 'il Baijada', or 'tal Borg'. The name Baijada (Bajda—white) derives, probably, from the greyish soil of the district, which is quite different from the darker red soil of the lower fields; the name tal Borg (Borg—castle or mound) may be derived either from a large mound to the north, which was probably a prehistoric building, or, possibly, from the mound once formed by the ruins which are being excavated.

The field in which the building was discovered is actually on the top of the hill, for, to the east and south, the difference of level between its surface and that of the adjoining lower fields is 3 ft. 4 in. (1 metre) and 1 ft. 7 in. (48 cm.) respectively; to the north and to the west it is 7 ft. (2.13 m.) higher than the other fields.

As the site is nearer to the Tarxien village than to Casal Paula, the monument will be referred to as the *Hal-Tarxien monument*.

It is hardly conceivable that the discovery of a megalithic temple could

be made by mere accident, and that the existence of a building, with blocks measuring, in some cases, not less than 15 ft., could be concealed under a neat, plain, unobtrusive field and completely deleted from the memory of the people.

In the year 1913 the tenant of the field in question mentioned, in a casual way, that a few feet below the surface he had seen some well-squared blocks of stone, and that whilst digging the foundations of a small chapel in a cemetery close by (Ta l'Erwieh) similar large blocks were met with. The man was asked to dig at the site mentioned, and, under about 3 ft. (1 m.) of soil, two large well-squared stone blocks appeared, whilst from the soil a number of sherds of undoubted neolithic type were collected. As no further steps could be taken that year the stones were covered up, and it was only in 1915 that it became possible to take up the investigation.

On the 20th July 1915 a trench was dug in the middle of the field, and the stone blocks were struck under about 2 ft. (60 cm.) of soil. Following the surface of the stones it appeared that these were so arranged as to enclose a circular space. Under the field soil, at the level of the large blocks, stones of various size, apparently thrown there to fill up that space, were also met with. The first impression was that the blocks formed the mouth of a large pit, but on removing the soil to the level of the stone blocks it was found that the space enclosed by them was not circular but elliptical, and that what appeared, at first, to be the mouth of a pit was the apse of a megalithic building formed of nine stone parallelepipeds placed end to end. By the end of the week a second apse was brought to light, at the same level with the first one and symmetrical with it.

The two apses suggested, at once, a neolithic sanctuary of the type of Hagiar Kim, Mnaidra, and Gigantia, and the excavations were accordingly conducted as if one of the above-mentioned sanctuaries had to be explored.

It was an unhoped-for opportunity to find a Stone Age monument of the size of Mnaidra still covered with the débris which had concealed it for ages, with, moreover, a great probability that the archaeological material had not been tampered with, and that it was consequently full of interesting relics of the epoch.

However interesting the buildings of Gigantia, Hagiar Kim, etc., may be, their ruins, at the time of their exploration, were cleared with the utmost disregard for minor objects, the excavators having had for their sole object the clearing of the stones to the rock. In the present case the débris and the soil that, by degrees, smothered and effaced the ruins were still in place, and could be removed with all necessary precautions. Unfortunately, only the deep layers remained untouched, for the upper part of the building was completely wrecked. The good material of which the sanctuary was built must, for centuries, have

attracted those who were in need of stone, and the monument was utilized as a quarry from the earliest times. Only the blocks which were made brittle by the action of fire and the blocks which had already disappeared beneath the dust of ages were respected; the rest was broken and carted away for building purposes.

Obviously, later on, when it came into the mind of some enterprising husbandman to turn the crumbling ruins into an arable field, further destruction took place. After breaking down all the uprights that could be an obstacle to the plough, the space between the large blocks was filled up with stone chippings and other *débris*, over which dust and soil from the neighbouring fields were spread. Signs of all these operations are evident all over the remains. On the northern portion of the ruins the field soil, 2 ft. 3 in. thick (69 cm.), was fairly uniformly distributed over the walls that were left standing, the cobbles and stone chippings filling the gaps inside the walls. On the southern portion the pavement, close to the entrance, lay under 7 ft. 10 in. (2.38 m.) of material made up of 2 ft. 3 in. (69 cm.) of soil, over 2 ft. 3 in. (69 cm.) of broken stones and dust, 10 in. (25 cm.) of earth, mixed with black ashes, and at the bottom 2 ft. 6 in. (70 cm.) of a dark brown earth remarkably free from stones.

Notwithstanding the complete and systematic destruction of the higher portions of the building, the rude boors who upset and broke up the standing walls did not care to uproot the stones that had already disappeared under the dust deposited in the course of centuries, nor to disturb and scatter the material of which they could make no use. We can assume, therefore, that under about 5 ft. (1.5 m.) of the field loam the archaeological material is fairly untouched by modern hands. This surmise has, so far, proved perfectly correct.

Having laid bare the top of the walls of the two northern apses, it was thought advisable to determine how far the building extended at that level. Excavations were therefore conducted so as to follow the blocks *in situ* and clear them of loose *débris*. The ruins were found to expand but slightly both east and west, but to the south they extended beyond the field in which the excavations were initiated.

It was not always possible, during the clearing of the loose material, to keep to the same uniform level, as some large stone blocks, evidently fallen down from a higher point, had to be removed with the *débris* down to the pavement.

The state of the excavation at this moment is, therefore, not exactly as one would wish it to be on theoretical grounds, but it is quite satisfactory; and without the need of hazarding conjectures as to the parts which are still hidden by the compact soil, sufficient material has come to light to justify one in giving a preliminary description of the monument and of the important objects discovered during two months of excavation.

The accompanying sketch plan (fig. 1) shows that the monument is of the type of the known Maltese sanctuaries. It consists, roughly, of three pairs of symmetrical apses connected with each other by means of narrow passages formed by large slabs placed on end. From north to south these apses are progressively larger in size.

To any one with a knowledge of the Maltese monuments it would appear that the building consisted, originally, of only two pairs of apses of the same size and type as those of the northern part of the Mnajdra and the northern building of the Ggantija.

It appears that at a later date, but still in the Stone Age, a third pair of apses was constructed farther to the south, but even if it be proved that the southern portion was constructed at the same time as the northern part, the former was undoubtedly improved and decorated in later days.

The whole monument is built on the same principles as the other sanctuaries of Malta and Gozo. The walls of the apsidal areas are made of vertical slabs topped by rows of horizontal, well-squared, long blocks; these walls are backed by a thick packing of stones and earth which completely fills up the space between them and the thick boundary walls, made of very large slabs placed on end, and by blocks wedged in between the two walls, the whole arrangement forming a compact mass which cannot be easily destroyed.

The areas so far cleared were found to be paved with enormous flagstones, closely fitting together to form a smooth surface. The passages from one area to another are in all cases lined with vertical slabs of stone strengthened by projecting pillar-like blocks closely fitted together.

The northern area (A-B) is 42 ft. (12.81 m.) long and 16 ft. (4.88 m.) wide at the middle. Stone blocks projecting into this area divide it into two apses and a central space corresponding to the entrance. In front of the entrance, in the northern wall, a niche is built which has not yet been explored.

The second set of apses (C-D), to the south of the former and connected therewith by means of a passage 6 ft. 6 in. (2 m.) long, is larger, being 59 ft. (18 m.) long and 19 ft. (5.79 m.) wide in the middle part. The wall of the western apse (D) on the left is continuous and unbroken. A peculiar feature is a large block of stone springing from the wall which must have been supported on the edge of another projecting stone forming a kind of roof at the north-west corner. This block, of which a large portion is missing, is now without an adequate support, and may fall down during the process of clearing the apse.

The wall of the eastern apse (C) is broken, and its limit is as yet uncertain. A vertical slab shows that a passage existed at one time which led to a space (L) behind the wall, connected with the north-eastern apse (A) by a steep flight of six steps constructed in the thickness of the wall. Two more steps are cut in

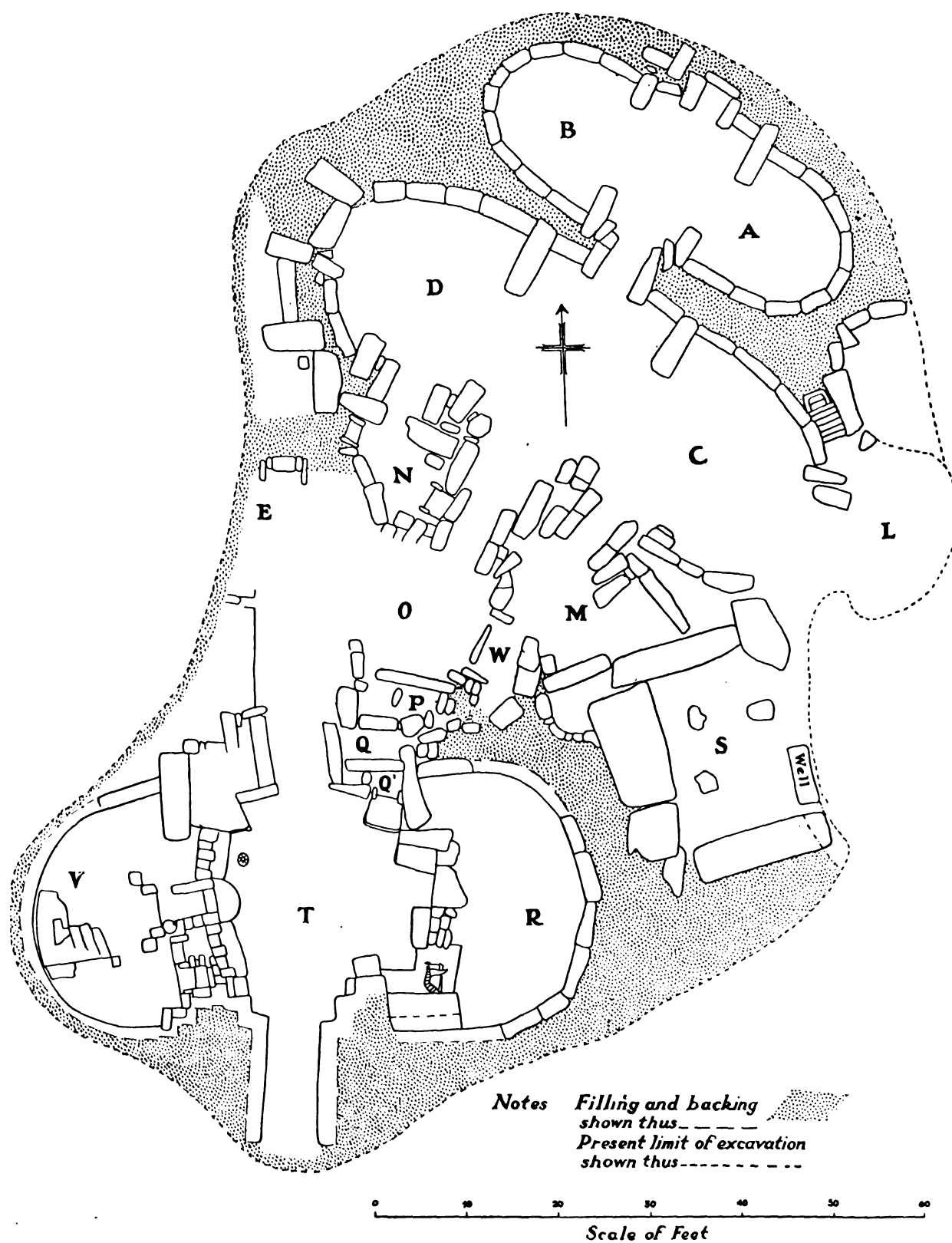


Fig. 1. Plan of the excavated portion of the Hal-Tarxien temple in September 1915.

a loose block of stone fixed over the surface of the apse wall close to a patch of thick white, beaten floor. To the north-east behind these steps is another unexplored area enclosed by a regular wall.

Three passages open in the southern wall; the one to the west ends in a small room (N) containing two niches built of slabs, one in the thickness of the western wall, and the other against the eastern wall. The passage to the east leads to a room (M), on the southern wall of which the figures of two bulls and one sow are cut in relief (pl. XXIII, fig. 2). This room appears to communicate with a space to the south through a window-like opening, but, as the material



Fig. 2. Niche and altar stone.

from this room has been cleared only for a couple of feet, the lower portions of the walls are still covered with unexplored material.

The central passage to the south, though still half full of soil, appears to be blocked, first by a slab standing on one of the sides and farther on by the backing (Q) of a niche (Q'). The space at the back of the niche when cleared contained only cobbles and stone chippings, evidently intended to fill up the space with a heavy material to support the wall of the niche.

On leaving this passage it is necessary to turn sharply to the right (west), into a space (O) still encumbered with débris, and then through another passage formed by large vertical slabs. Before reaching this passage a niche (E), built of slabs and

blocks and limited in front by a semicircular wall of slabs, is found to the left, in front of the passage. This niche, still encumbered with the loam of the field, is backed by a strong rubble wall ending in a large block of stone to the north, close to the boundary wall.

The passage (TE) is regularly paved, and leads into the third set of apses, which, so far, is considered a later addition to the monument. This large area to the south is divided by septa of low blocks into a central space (T), a semicircular apse (R) to the east, and an irregular space (V) to the west.

The central space, which is well paved with very large slabs, is approached from the south through the main entrance to the building, and is flanked by enormous blocks of stone, partly destroyed, which may have served the purpose of footstones to standing slabs.

In this space the main object facing the entrance is a very elaborate niche (Q) made of well-cut slabs with a window-like opening in front. A large rectangular block of stone in front of the niche probably served the purpose of an altar (fig. 2). The sides of this block are ornamented with a design of spirals in low relief. The front surface, which at first appeared even and continuous, was found, on closer inspection, to have a semicircular opening, skilfully concealed by means of a conical stone plug, bearing externally a spiral ornament, so deftly continuous with the rest that the line of junction can hardly be perceived. When the plug was removed the altar stone was found to be hollow and to contain fragments of bones (ox, sheep, etc.), among which portions of limb bones and large horn cores were conspicuous. Sherds of good neolithic pottery and a very fine light-coloured flint sacrificial knife were found, together with thirteen other flint implements (pl. XV, fig. 1).

Low stone blocks, all covered with spirals of different patterns, form a septum to the east of the central space (T). These low blocks, which are arranged as a kind of dado round the room, were originally surmounted by stone slabs, probably also covered with sculptures. At the south-eastern angle of this room a large fragment, still *in situ*, of a colossal stone statue was discovered. Of this fine statue, which must have been more than 7 ft. high, only the lower portion remains, consisting of two pear-shaped legs surmounted by a fluted kilt (pl. XV, fig. 2). The upper portion of the statue must have been carried away, for no fragments of it were found.

Beyond the septum to the east a semicircular room (R) was cleared, the walls of which were found to be badly ruined by the removal of stones. Within this space numerous fragments of two large stone troughs, with ornamented surfaces, and of a large clay bowl were found.

The western limit of the central room (T) is most elaborate and symmetrical (pl. XV, fig. 3). An altar, to the south-west, has the front ornamented with

fine spirals in relief and the upper surface with a low step at the back divided into three parallel portions. At the back of this altar a niche was constructed of which only two walls remain.

Beyond this altar there is a narrow, well-constructed passage leading to another room (v), and further on another altar, similar in all respects to that just described, with a low cylindrical pillar in front, having a pitted surface and a marked concavity at the top.

Farther up, a third block, nearly cubical in form, lies at the north-west angle of the same room, and is highly ornamented with spirals throughout, including the upper surface (pl. XVI, fig. 1).

The space (v) has not been completely cleared, so far, but from the numerous ornamented stones discovered *in situ* it is already evident that it was a room of special importance.

The base of the niche, at the back of the first altar, is a fine block of stone $5\frac{1}{2}$ ft. (167 cm.) long and 10 in. (25 cm.) high, on which a frieze of wild goats is beautifully cut in low relief. There are two rows, each of eleven goats measuring 6 in. (15 cm.) from head to tail. They face to the left and have the limbs bent at an angle suggestive of slow movement; they have long, tapering, horizontal horns, slightly curved, and short tails.

In the same room another slab was similarly decorated. Of this slab only one-half remains, measuring $3\frac{1}{2}$ ft. (1.06 m.) by 8 in. (20 cm.) in height. A row of animals, facing to the right, is cut in low relief on this slab, viz. four wild goats, one fat pig, and a buck with horns erect and curved at the extremity and three tufts of hair between them (pl. XVI, fig. 2).

That the site was in part utilized even in Punic times can be inferred from the potsherds obtained from the surface of the field before the neolithic layer was reached. To the south of the eastern apse (c) a space about 7 ft. deep (2.13 m.), 18 ft. long (5.5 m.), and 15 ft. wide (7.5 m.), is in part cut in the rock, the rest being constructed with stones of various size. To the west, the wall is constructed of two courses of large stones, and the northern wall is made of one huge block, now cracked but *in situ*; to the east the site has not yet been cleared, and to the south the cistern is bounded by a monolith which appears to have fallen from the erect position on the west. Two pillars, in the middle line, suggest the probability that the cistern was once covered with long stone slabs after the system adopted in the water-tanks of Punic or Roman times. The sherds found in the cistern are of Punic character of a later type.

This brief description of the building, so far as it has been explored, gives but a faint idea of the importance of the monument, which is the most elaborate in the Maltese islands.

In the course of the excavations, at about four feet under the surface of the

field, in the south-western part of the building, potsherds of a type not known in these islands were met with along with small heaps of incinerated human bones. Small clay vessels of unusual type were also found with the bones, and small flat beads, in tiny heaps, were discovered among the ashes. This was becoming very puzzling when, on the 6th September, one of the workmen brought out of a heap of ashes a triangular piece of copper which he thought to be the broken hinge of an old box. The object, on being cleaned, proved to be a copper dagger 130 mm. in length, 1-2 mm. thick, with a base 55 mm. wide, and tapering at the other extremity to a rounded point. The mystery of the unknown type of pottery was soon solved. We were here in the presence of a burial-place of the Bronze Age. This was the first time that traces of the Bronze Age had been met with in the islands, and the discovery could not be more gratifying, for the metal implement was found amongst pottery and personal ornaments typical of the Bronze Age, in a building raised in the Stone Age, full of implements, pottery, personal ornaments, statuettes, etc., as typical of the late Neolithic Age as one can desire.

Of the Bronze Age we had here a burial-ground or, better, a repository of cinerary urns containing the remains of bodies cremated in the immediate vicinity, together with funeral pottery, personal ornaments, implements, and food-stuffs deposited as pious offerings with the ashes of the dead.

This burial-ground did not occupy the whole extent of the neolithic building, but only about one-fourth of it, extending from near the main entrance to the space at the back of the niche (Q') and to the room (M) at the back of it.

A layer of dark soil, about one foot thick, evenly spread at a height of about 3 ft. (1 m.) from the pavement, contained ashes and sherds, but outside this layer no ashes nor pottery of the Bronze Age were found.

That the bodies were cremated within the building we can surmise from the burnt condition of the stones against which the funeral pyres were dressed. The Malta building stone, under the influence of fire, becomes red and rapidly disintegrates. It is noteworthy that the 1 ft. (30 cm.) layer of dark grey, ashy soil, containing bones and sherds, was constantly found at about 3 ft. (1 m.) above the pavement, and that, below this, the Bronze Age material does not appear.

In the areas so far excavated the soil, under the Bronze Age layer, is also quite different from that found above it; between the black layer and the pavement, the soil, devoid of stones, is fine and sandy as if carried in slowly by rain and wind. On close examination the stratification of this fine, sandy layer became very evident in the main passage (TE).

From all these data the following conclusions appear to be legitimate: The building in question was erected in the late Neolithic Age, and was very probably used as a sanctuary. Before the full development of the Bronze Age this sanctuary fell into oblivion, and the various rooms and courts were gradually filled

up with dust and other light *débris* such as are usually carried by natural agencies. When about 3 ft. of this sandy deposit had settled upon the pavement, thus covering the lower part of the building, the remains of the monument attracted the attention of the Bronze Age population as a suitable place wherein to burn the bodies of their dead and to deposit the cinerary urns. The high walls, still standing, gave excellent shelter to the funeral pyres, and the spaces, enclosed by lower walls, made a convenient depository for the ashes of the dead. The hundreds of cinerary urns may originally have been buried in earth, or in the course of time the earth may have gradually covered them and concealed them from view. After the burial-ground was abandoned and completely forgotten the destruction of the building followed, first for the sake of the good stones of which it was built, and, later on, for turning the place into an arable field. Further exploration may bring to light other material to explain some features of the building, but it is hardly probable that the conjectured relation of the Bronze Age burials to the neolithic building can be much modified.

THE BRONZE AGE OBJECTS.

The objects of the Bronze or Early Metal Age, met with so far, are all funeral. As already mentioned, the bodies, at this particular period, were cremated, and the ashes were placed in large urns in which ritual vases and objects of personal adornment were deposited. Along with the objects mentioned the pious hands of the relatives placed herbal tributes of wheat, beans, peas, etc., both as plants and as seeds which, scorched, but not reduced to ashes, became carbonized and intimately mixed with the objects. Most of the bronze implements found are still covered with the carbonized grasses and seeds, fixed to the metal by its salts. At the bottom of many of the urns a thick layer of charred vegetable matter was found in which the stems of graminaceous plants were easily recognized.

Some of the incinerated bodies were obviously dressed or wrapped in a shroud when placed on the pyre, for the ashes of some of the urns contain lumps of fine and coarse tissues which, on closer examination, show clearly the texture of the fabric. These masses of burnt fabrics are of a dark or light reddish yellow colour, readily distinguished amongst the grey ashes. The original dye must have been an iron ochre, for, on analysis, the ashes show that metal in considerable quantity. The personal ornaments and other objects were, presumably, placed in the urns after the body was cremated, for objects of a very delicate nature do not show the least trace of fire. The long bones were broken to fit into the urn, but not so the skulls, of which two were removed whole from the mass of

bones. The other skulls found were smashed, probably, by the pressure of the heavy material heaped upon them.

Personal ornaments. The personal ornaments found in the cinerary urns were mostly beads and pendants to form necklaces.

The elements of these necklaces were varied and heterogeneous, including shells (*cyprea*, *pectunculus*, *trochus*), stone almond-shaped pendants, miniature clay objects such as pots, figures of birds, etc., fish bones, carved leg bones of birds, animal teeth, small stone and shell beads, and claws of crabs.

Plates XVI, fig. 3, and XVII, fig. 1, show some of the objects obtained from the ashes of the cinerary urns. Small beads, black or white, are numerous. They are about 5 mm. in diameter, and 1 mm. to 3 mm. in thickness, with a perforation 1.5 mm. to 2 mm. in diameter. The white beads are the more numerous, and are usually cylindrical with smooth edges. Some of them are of a whitish substance, light, porous, friable, not acted upon by acids. They are probably made of pumice-stone. Other white beads are made of some other stone, and others of marine shells. The black beads are made of a hard stone. They are thinner than the white beads, have slightly irregular edges, and are polished on one side and rough on the other. The hole on the smooth face is large and conical, on the other side it is smaller. These beads appear to have been cut from a tiny cylinder made by rolling a pebble between two harder stones. The tip of the cylinder was first rubbed to get a polished face, then drilled for a depth of 1 mm., when the cylinder was filed all round and chipped off at the point by a sharp blow of a flint knife. The preliminary filing is clearly indicated, and the rough surface is the result of the splitting of the stone. The string on which the beads were threaded must have been of an organic nature as no trace of it was ever found. The beads, however, were undoubtedly threaded, for, in some cases, tiny piles of beads are found, agglomerated together by age in their original positions. Long strings of beads must have been used, for as many as 6,000 beads were obtained from one single urn. When bronze (or copper) objects were contained in the urn some of the white beads acquired a green tinge.

The stone almond-shaped pendants are mostly coarse in texture as well as in shape and finish. Most of them are of a dark grey stone resembling slate, others of a grey whetstone. They imitate the Stone Age pendants in shape, but are rough and clumsy.

Of the clay objects, drilled for threading, the more remarkable are two tiny carved jars with one handle, and figurines of birds, of which one strikingly resembles a quail (pl. XVI, fig. 3, nos. 5 and 6).

Fish vertebrae are very common and of various size. The largest found measured 20 mm. in diameter and 9 mm. or 17 mm. in height, the smallest being 6 mm. in height and 13 mm. in diameter. 125 of these bones were found in one urn.

Very curious are the bone cylinders made from the legs of birds. The largest are 60 mm. long with an external diameter of 10 mm. These bones are either plain, or, more often, ornamented with ring-like incisions as shown in pl. XVII, fig. 2.

A number of peculiar clay objects were found among the contents of the cinerary urns which, as they have not to my knowledge been met with in any other part of the world, deserve a special notice.

These clay objects, shown in pl. XVIII, figs. 1 and 2, are all made on the same pattern but are differently finished and ornamented. Each of them consists of a disc, 8 mm. thick, with deep incised ornament on both faces, with an average diameter of 9 cm. (4 in.), surmounted by a tapering, finger-like projection 4 cm. long. At the opposite point of the circumference is another projection, grooved in the middle, and curved so as to represent two human legs bent in a sitting posture. The disc can stand on the pair of legs, being supported at the back by a prop of clay jutting out at an angle. In some of the objects the two legs are most distinctly rendered, whilst in others they are more conventionally treated.

The use and the meaning of these symbolical objects are not, perhaps, very clear, but when all the details are taken into due consideration one cannot fail to see the probability of their being conventional representations of the generative power of nature.

Two clay statuettes were also found among the ashes. They are both made of very coarse material mixed with white fragments of shell or of limestone with a polished slip of finer material, of an ochreous red colour, on the surface. One of the statuettes is figured in a sitting posture on a kind of stool. The bust is simply a flat disc, and two small symmetrical knobs indicate the sex. The face is round with a pinched nose and a straight chin. The eyes and the mouth are represented by small holes in which white beads were inserted. The figure wears a large head-dress like a Panama hat, of which the brim is curved at the back. It was found broken into three pieces but was easily repaired. The feet are missing. It measures 225 mm. in length, the width of the hat is 85 mm., that of the face 35 mm., that of the chest 80 mm., average thickness of body 12 mm., diameter of stool 72 mm. (pl. XIX, fig. 1).

The other figurine is more fragmentary. The head-gear is missing, though the few fragments recovered show that it was of the shape of that just described; the chest shows two lateral stumps meant for arms, and the body ends before reaching the lower limbs. The face is more oval than the other, but the nose and chin are very similar. The lobes of the ears are pierced, probably for the insertion of ear-rings. This figure measures 140 mm. in length with an average thickness of 15 mm. Width of the face 35 mm. and maximum width of chest 75 mm.

Pottery. The pottery of this period consisted of large globular cinerary urns with wide mouth and big handles in which the remains of one or more cremated bodies were deposited, along with ritual offerings, which often consisted for the most part of smaller clay vessels. As to the large urns, not one was found unbroken, but the sherds are large enough to give a clear idea of their size and shape.

Of the smaller vessels, most of which must have been votive offerings, over sixteen varieties have been found. The type of the ornamentation of these vessels is clearly given in pl. XIX, fig. 2.

I. The more common variety of the smaller vessels is a globular jar with a short, wide, conical neck, and provided with a curved handle fixed to rim and shoulder (pl. XX, fig. 1, no. 5, and fig. 2, no. 6). Of forty-three vases of this shape six are ornamented with deep incisions in wavy bands and hatched fillings. One of them has, under the neck, two prominent discs, probably meant for eyes. These vessels vary in height from 197 mm. to 35 mm. (8 in. to $1\frac{1}{2}$ in.), and in circumference from 130 mm. to 64 mm. ($5\frac{1}{2}$ in. to $2\frac{1}{2}$ in.).

II. Similar types of vases, but with short neck and furnished with double flat handles (pl. XX, fig. 1, no. 2, and fig. 2, nos. 1 and 4), vary in height from 153 mm. to 55 mm. (6 in. to 2 in.). Of eleven pieces found, four are plain and hand-polished, the rest are ornamented with incised bands and lines.

III. A peculiar type of vase, of which nine specimens have been found, is an elongated conical bowl with small base and lips turned outward. It has an everted rim with a projection on one side and a notch on the other. It has a small handle on one side (upper row, pl. XX, fig. 3). Four of these vases are carefully ornamented.

IV. Three 'bell'-beakers with rather low neck and a small handle. Average height 180 mm. ($7\frac{1}{2}$ in.), diameter 215 mm. None of them is ornamented (pl. XX, fig. 4, no. 3).

V. Nine graceful duck-shaped vessels (*vase-à-canard*) with slightly everted neck and low handle (pl. XXI, fig. 1, nos. 1 and 4). They are mostly covered with a red slip and polished; one of them is ornamented.

VI. Eight globular vases with low, short, wide, everted neck and very small handle; one is ornamented with incised lines and one with little knobs (pl. XX, fig. 4, no. 2).

VII. Seven elegant ring-footed vases, mostly polished and ornamented with knobs and eye-like discs and a small side handle (pl. XXI, fig. 1, no. 2).

VIII. Five well-shaped small jars with short everted neck and handle from lip to side, ornamented with knobs and eye-like raised discs (pl. XX, fig. 1, no. 1).

IX. Nine wide-mouthed cups, conical in shape, with large heavy handle not in proportion with the body of the vessel, which, weighed down by the heavy handle, is hardly able to stand (pl. XXI, fig. 1, no. 3).

X. A composite vessel made of two globular jars touching each other at one side and united by a handle which, embracing their mouths, curves back and divides before fixing itself on their backs. Three complete vases of this type were found and fragments of several others. They are all profusely decorated (pl. XX, fig. 2, no. 2).

XI. One composite vessel consists of three low, wide-mouthed cups fixed together at the sides, without a handle of any sort.

XII. Another pretty globular jar, 80 mm. ($3\frac{1}{2}$ in.) high, has a narrow neck surmounted by three handles running from lip to shoulder (pl. XX, fig. 2, no. 5).

XIII. A very quaint vase, 157 mm. (6 in.) high and 70 mm. (3 in.) in diameter, has a globular body and a wide neck, with thick rim in which six cylindrical holes are cut vertically. The holes communicate with the inside of the vase, and, on the outside, give to its neck a fluted appearance. It has a handle extending from lip to side. The whole arrangement suggests a chandelier, but no trace of burning is observable on the rim (pl. XX, fig. 2, no. 3).

XIV. One small, dainty bowl on three tiny conical feet is well finished and ornamented with deep incised lines. It has a small handle at the side (pl. XX, fig. 4, no. 5).

XV. An elongated vessel with globular base has two narrow-lipped necks, welded together, and a small handle at the side.

XVI. Two globular jars with short, narrow, slightly inverted neck and small side handle, 90 mm. ($4\frac{1}{2}$ in.) high, covered with a red slip and carefully hand-burnished. Each has in front a couple of raised eye-shaped discs surmounted by semilunar bands, recalling to mind the owl vessels of Hissarlik.

All this pottery is hand-made and hand-polished; the clay is often coarse and friable, the best pieces being covered with a slip of finer material which flakes off very easily. The ornaments are in freehand and the incisions very deep, worked on the moist clay. No filling, white or otherwise, is resorted to. Some of the black ware is better finished and made of finer material, but the artistic value of the pottery of this period is vastly inferior, as regards quality, shape, and design, to the neolithic pottery of which many remarkable specimens have been already obtained in the course of the excavation.

It is not probable that other objects of the Bronze Age will be met with during the course of the excavations, for the area occupied by the buried urns is limited to the southern portion of the ruins, and no trace of it has been discovered to the north of the central space (o).

Metallic objects. The following metallic objects were obtained, chiefly from space O:

I. *Daggers.* Eight daggers of the shape shown in pl. XXI, fig. 2 were obtained in various states of oxidization. The metal is of a reddish colour and is quite soft, some of the daggers having been found badly bent through the pressure of objects lying upon them. It is very probable, therefore, that the metal of which they are formed is copper and not bronze. Some of the daggers have two holes at the base, and others three, and the rivets, which fixed them to the wooden handle, are very often *in situ*. In one case a fragment of the handle is still attached to the rivet.

II. *Chisels.* Of the eleven chisels obtained, some are bevelled and others plain at the sides. Some are in a bad state of oxidization, others have still attached to them grains and beads which were deposited in the urn along with them. Their weight varies from 49 grms. to 332 grms.

III. *Bronze awls.* Numerous bronze awls were obtained, with bone handles more or less charred (pl. XVII, fig. 2). Several pieces of pumice-stone, with deep grooves showing how the awls were sharpened and cleaned, were found.

IV. *Silver.* Fragments of silver plaques, about 1 mm. thick, were found on two different occasions. The thin plate is oxidized to a grey surface, and in one case beads, buried with it, have stuck to it in the course of time.

THE NEOLITHIC OBJECTS.

The objects of the Stone Age, so far met with, are not very numerous, for the simple reason that the archaeological material below the Bronze Age area has been only reached at a few points, very often unintentionally, when the removal of a loose block of stones brought us near the floor of the building.

Carvings on stones. Many of the slabs so far discovered are ornamented with regular pit-marks, as is the case with the stones of the Mnaidra, Hagiar Kim, Cordin, etc. The peculiar features of the Hal-Tarxien sanctuary, however, are the carvings, in bold relief, on stone blocks in the southern apses and in the chamber immediately beyond the entrance. The spiral is the motive underlying all the ornamentation, and the work is always executed with the greatest freedom and the most consummate skill (plates XV, fig. 3, XVI, fig. 1, XXI, figs. 3 and 4, and XXII, fig. 1 show this very clearly).

Plate XXII, fig. 3 shows the most recently discovered stone block in front of the entrance. This photograph is very important, as it proves that the ornamented stone was completely covered with soil when the Bronze Age urns were deposited on the beaten floor about 1 ft. above its surface.

Plate XXII, fig. 2 shows, likewise, slabs laid on a layer of soil which had buried the ornamented altars shown in pl. XV, fig. 3. The boy stands on one of these slabs, and the thin black layer of ash, appearing in the section of the soil at the back, is the Bronze Age layer in which all the objects, already described, were found. Pl. XXIII, fig. 1 also shows the same layer with some pottery *in situ* just above the stone block seen in pl. XXII, fig. 3. These photographs constitute very important evidence of the use of this sanctuary by the Bronze Age people at a time when the building was already dilapidated and buried under quite 3 ft. of dust.

Plate XXIII, fig. 2 shows two bulls and a sow cut in relief on the walls of room M. The long horns and the high haunches connect these animals with those depicted on the plate found at Hal-Saflieni and described by Tagliaferro in *Liverpool Annals of Archaeology*, vol. iii, nos. 1 and 2, pl. XV.

The most important loose stone objects obtained are fragments of models of megalithic buildings carved in Maltese building stones. These show the usual slabs on end on which courses of ashlar masonry are laid. Pl. XXIV, fig. 1 is the model of a building of which we have not, as yet, found any specimen in the islands.

Stone statuettes. The limited search in the neolithic material has already brought to light fragments of at least eight statuettes of the Hagiar Kim and Hal-Saflieni type—fat deities nude or draped, squatting or standing. The peculiarity of some of the Tarxien statuettes is the fluted kilt, which is seen in the large statue to the right of the main entrance, and has never been noticed before in Malta. One small, squatting, nude, headless figure is very graceful, and shows a dignified repose, though made on very simple lines.

Symbolical objects. A very unusual group, made up of three pillars representing, in all probability, the generative power of nature, was met with in the early stage of the excavations. The group measures 125 mm. (5 in.) by 62 mm. (2½ in.), and has a projecting back which may have served the purpose of a handle, if it were carried about as a sacred object (pl. XXIV, fig. 2). A fragment of a carved slab, shown in the same illustration, on which are carved two pillars resting upon a pitted base, points to the same obvious meaning. This direct allusion to the generative power of nature throws light on some problems connected with our megalithic ruins which have been, by many, considered to be connected with the worship of nature.

A few conical stones were met with; one of them, found carefully buried under a block of stone behind the statue in the space R, is ornamented with deep pittings. It has a square base, and measures 170 mm. (7 in.) in height and 50 mm. (2 in.) across the base.

Conical stones. Conical stones were found which, owing to their great number, must have had special importance in these sanctuaries. Some of the cones have a cylindrical base and a sharp point, others are rounded off at the point. These cones (pl. XXIV, fig. 3), probably meant to stand as objects of veneration, were abundant in the vicinity of the altars. One of them was found, *in situ*, fixed into a corner of the space where the statue stands. Some of these cones are ornamented with lines on the upper portion, and there is abundant evidence that they were originally covered with red paint. Other conical and hemispherical stones are flatter and have concave bases (pl. XXIV, fig. 3, nos. 2, 6, 7). They have the appearance of thick saucers, and it is possible that their use was to carry a hot viand. They would have served the purpose of lamps if they had been a little deeper, but no trace of burning was ever observed on their rims. These conical stones are found in great numbers; over a hundred of them were found in the space L, some disposed in regular rows, and some lumped together by means of lime plaster. Signs of burning were evident in this site, and one could argue that, at some point of the ceremonial, these saucers were thrown upon a fire.

Grindstones. Numerous grinders of the usual type were found in various parts of the ruin. They are of different sizes, made of a black lava, oval in shape, with one side flat and smooth and the other convex and rough.

Flints. Flint, chert, and obsidian instruments have been obtained in abundance. Pl. XV, fig. 1 shows some flints found carefully concealed in the base of niche Q' in the first room T. One of these is a fine, thin, brownish, amber-like knife with very keen edges, and distinctly curved on the upper third of its length.

Miscellaneous small objects. Considering that the lower portion of the sanctuary has not been reached, except in a few places, it is natural that only a few small objects have been, so far, met with. However, some of these have a peculiar importance.

The head of a clay figurine, 40 mm. high, has an upturned face and a pointed chin. The hair is done as in the figures found at Hagiar Kim, Hal-Saflieni, and Gigantia, and is sharply cut at the level of the neck like an Egyptian wig.

Several triangular jade-like pendants were obtained, and some small clay reels or columns, one of which is pierced through its middle portion.

Bone objects. A number of bone borers and burnishers were found, mostly concealed in odd corners and under stone blocks (pl. XXV, fig. 1).

Pottery. The neolithic sherds are of the same type as those known in connexion with other megalithic buildings of these islands. Nearly all the types described by Tagliaferro in the *Liverpool Annals of Archaeology and Anthropology*, vol. iii, nos. 1 and 2, were collected. The fine, black, highly burnished ware with

fine scratched ornament is abundant; specimens of painted ware are common, especially in the space L. At this point it was our good fortune to find groups of large vessels, some whole and some broken *in situ*, but easily reconstructed.

Plate XXV, fig. 2 shows a group of amphorae made of a fine reddish brown clay not more than 10 mm. ($\frac{1}{2}$ in.) thick. About $\frac{1}{2}$ metre (20 in.) high, they are very graceful, and their surface is polished and carefully finished. The string holes, which may have served the purpose of handles, are probably intended merely as ornaments; as was obviously the case in some of the other vases. These amphorae are shown in pl. XXVI, fig. 1, as found, *in situ*, in the space L.

Plate XXVI, fig. 2 shows a fine bowl, with turned-in neck forming a rim, extensively ornamented with scratched lines. It is $\frac{1}{3}$ metre ($13\frac{1}{2}$ in.) in width, perfectly finished and burnished.

Plate XXVI, fig. 3 is a magnificent jar of a light fawn colour, 51 cm. (20 in.) high. The scratched ornaments are filled with red ochre which is still clinging to the lines. It has a triangular handle and small knobs to break the line of the shoulder. The string holes at the neck are merely for ornament.

Plate XXVI, fig. 4 is a bell-shaped vessel, over 60 cm. (2 ft.) high and 35 mm. thick, made of a rougher material, ornamented, at the outer surface, with a fish-scale pattern. This vessel was made up of circular bands of clay joined together by a kind of mortise joint, which was carefully filled up before the final baking. Two jars of this type, found in fragments, were reconstructed; but sherds of many others were collected which cannot, so far, be brought together so as to restore the original vessels.

All the objects discovered during the course of the excavation will shortly be exhibited in the Valletta Museum.



Fig. 1. Flint implements found under the altar of niche Q'



Fig. 2. Room T, showing on right fragment of a colossal stone statue

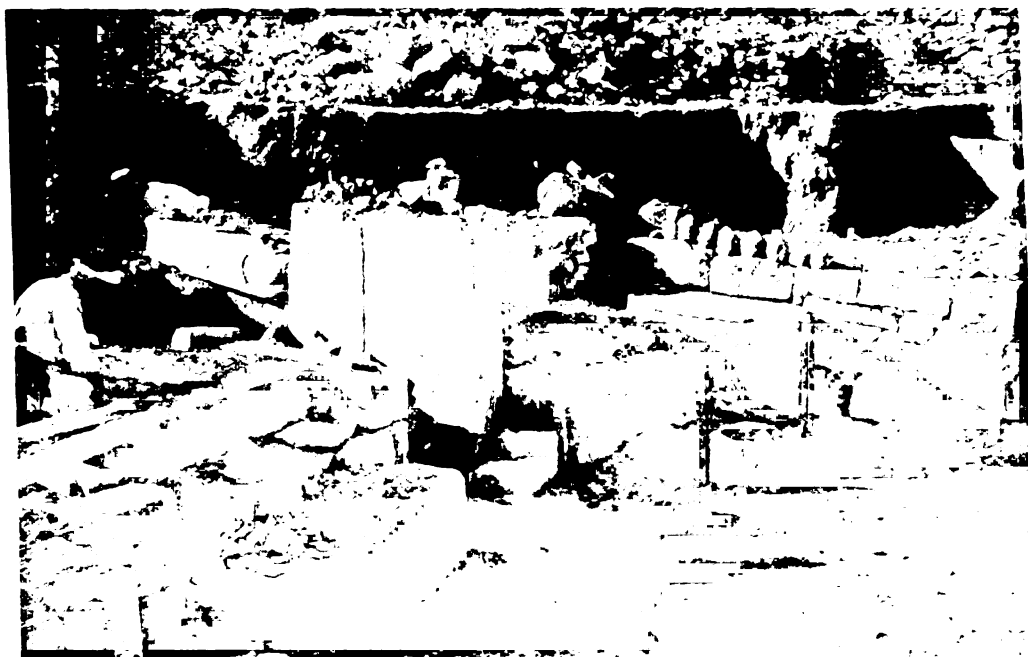


Fig. 3. Western side of room T

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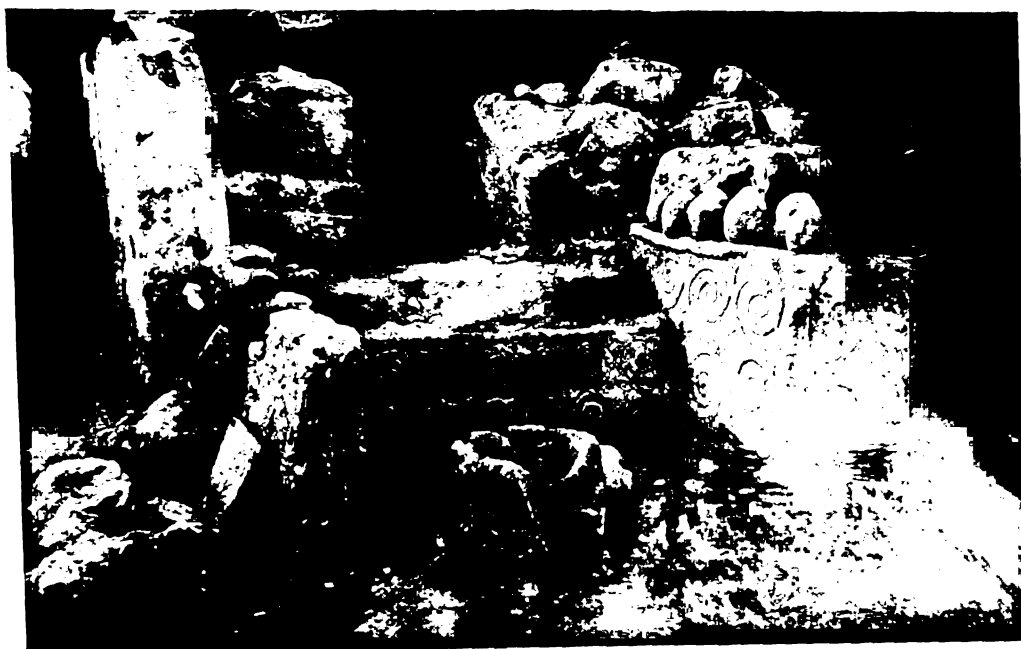


Fig. 1. Blocks ornamented with spirals in room T

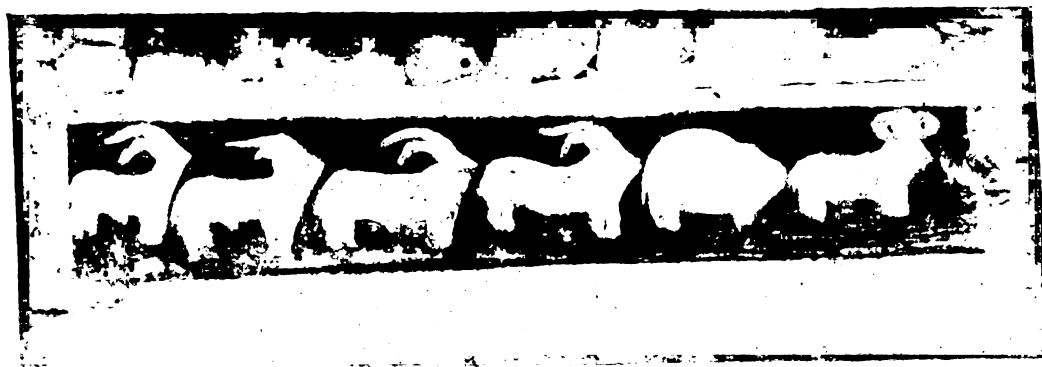


Fig. 2. Relief of animals in room V

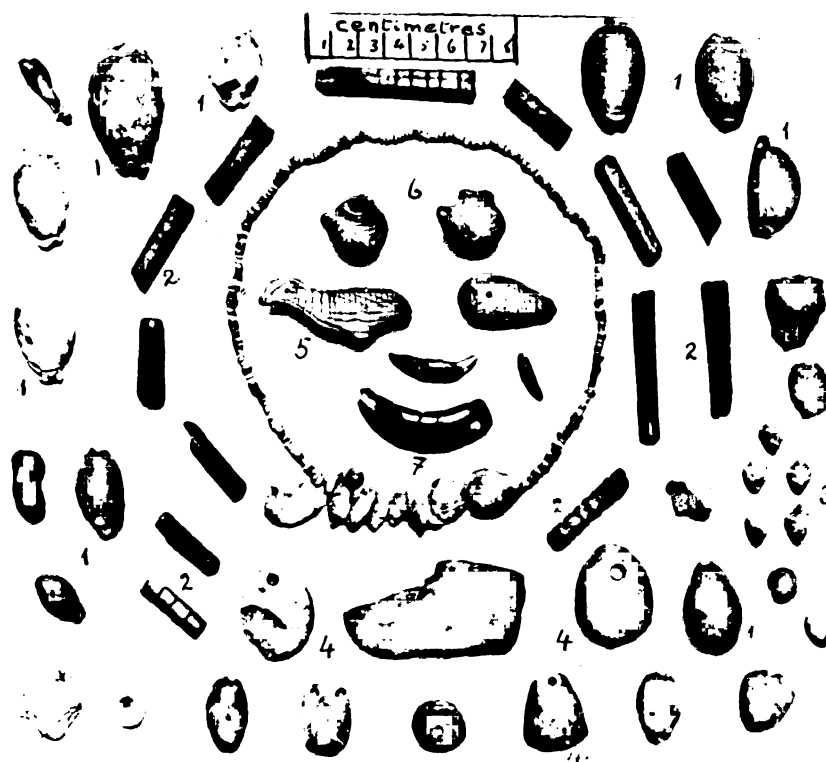


Fig. 3. Clay birds, beads, etc., from necklaces

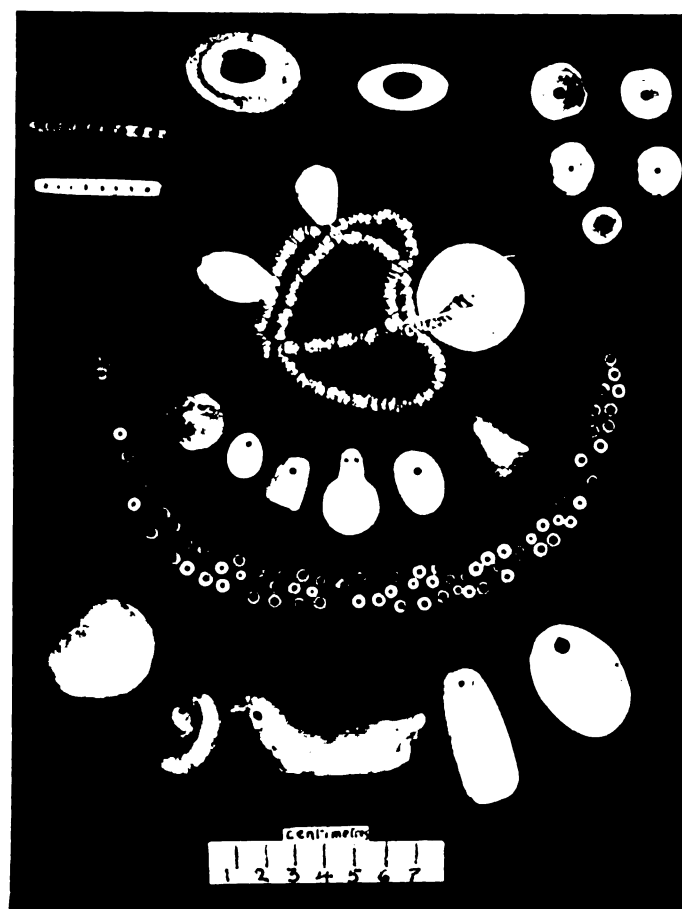


Fig. 1. Beads, birds, etc., from necklaces

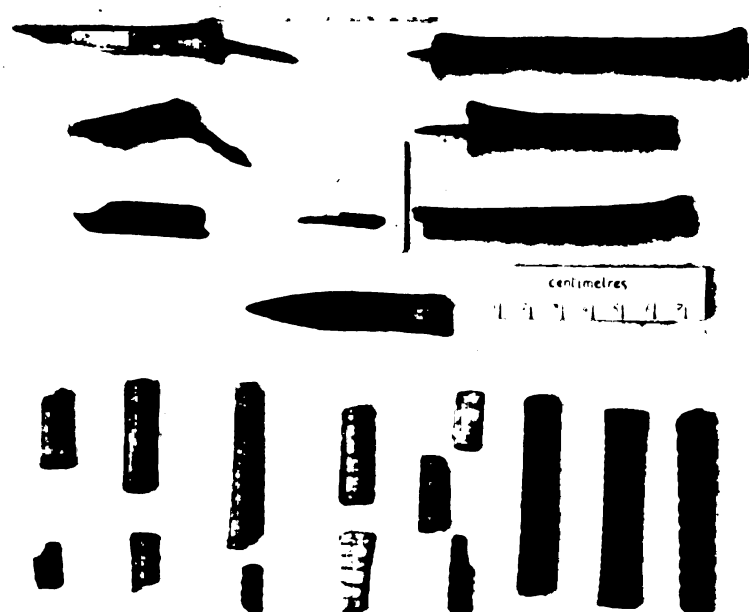


Fig. 2. Bone cylinders made from the legs of birds, and bone awl handles

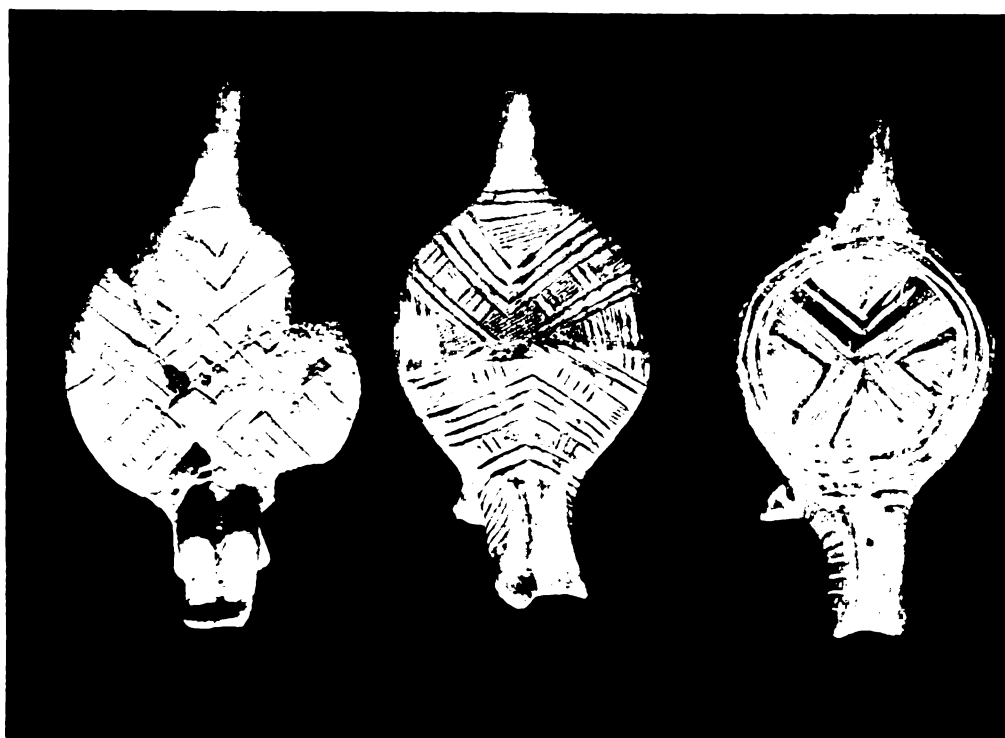


Fig. 1. Clay objects of doubtful use



Fig. 2. Clay objects of doubtful use

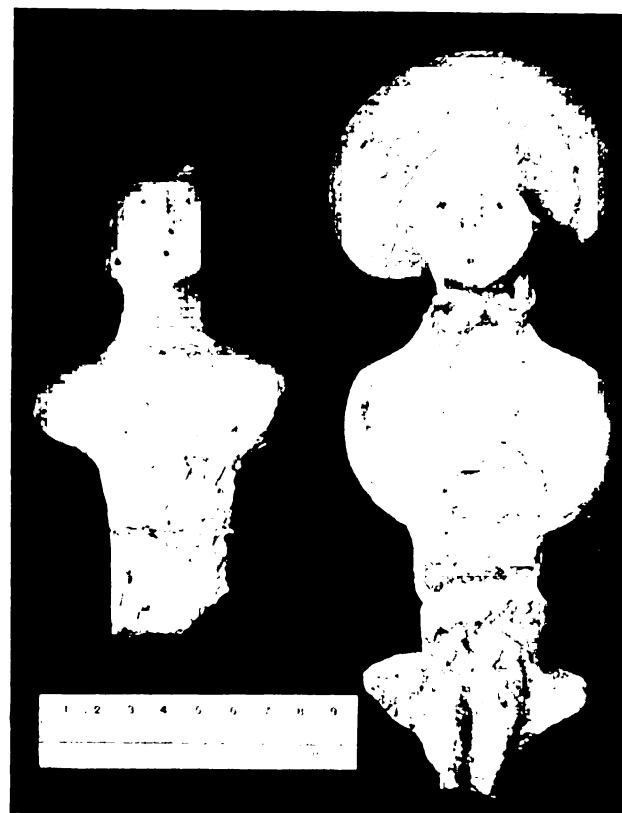


Fig. 1. Clay statuettes, Bronze Age period



Fig. 2. Bronze Age decorated pottery



Fig. 1. Bronze Age pottery



Fig. 2. Bronze Age vases



Fig. 3. Bronze Age pottery



Fig. 4. Bronze Age beakers and other pottery

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Fig. 1. Bronze Age pottery

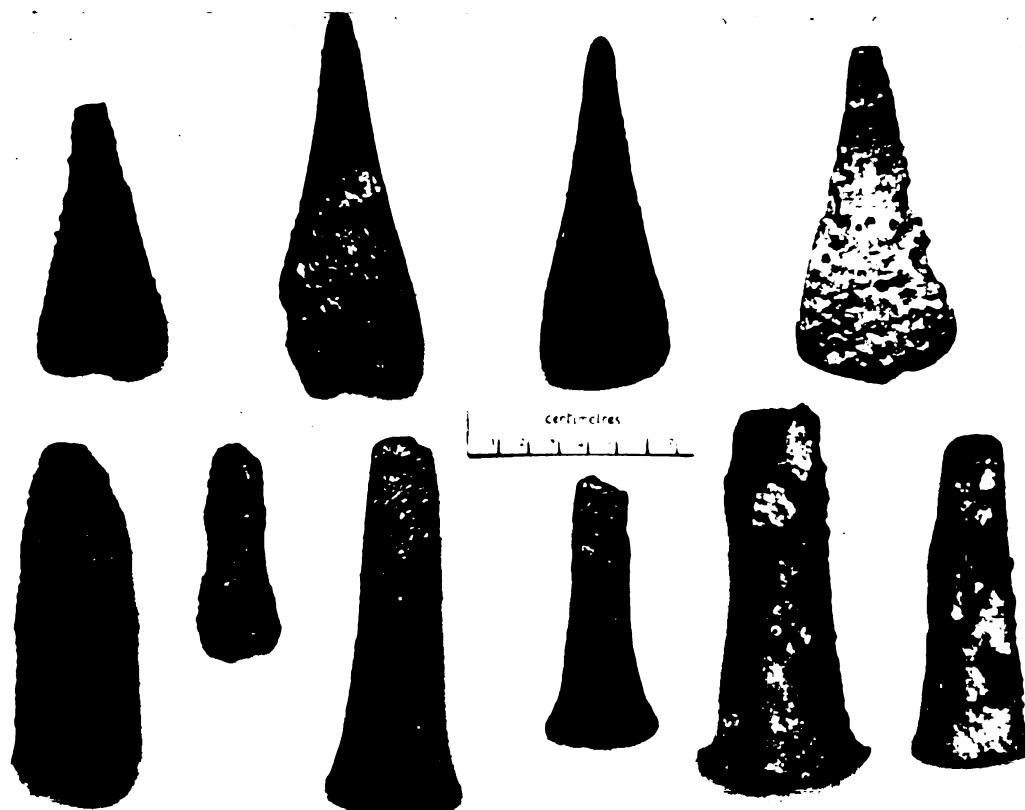


Fig. 2. Bronze or copper daggers and celts



Fig. 3. Stone block with spiral ornament



Fig. 4. Stone block with spiral ornament

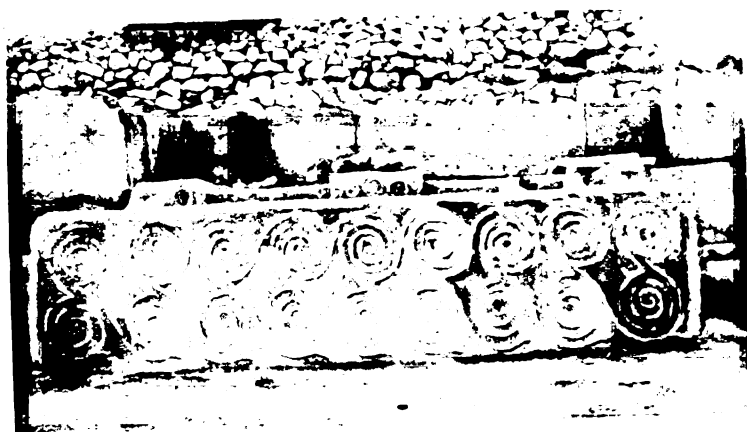


Fig. 1. Stone block with spiral ornament



Fig. 2. Slabs above the ornamented altars in room T. The black Bronze Age layer can be seen at the back



Fig. 3. Stone block, with spiral ornament, below Bronze Age layer

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Fig. 1. Bronze Age layer with pottery



Fig. 2. Relief of bulls and a sow in room M

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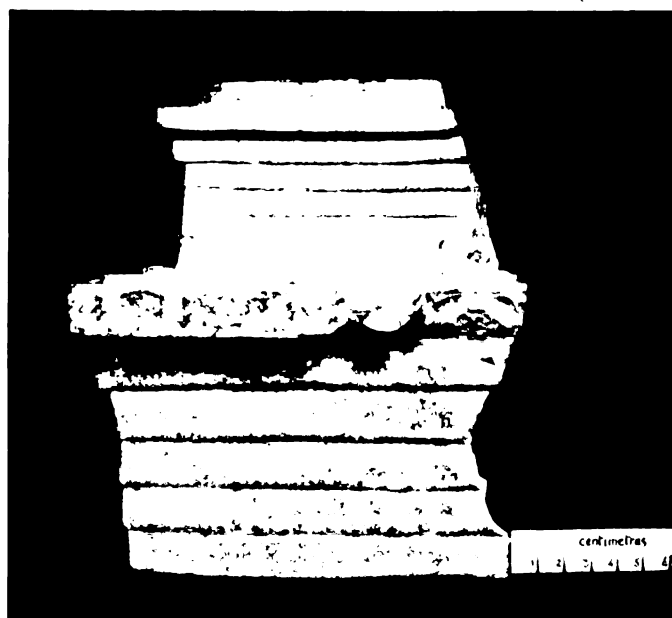


Fig. 1. Model of a neolithic building

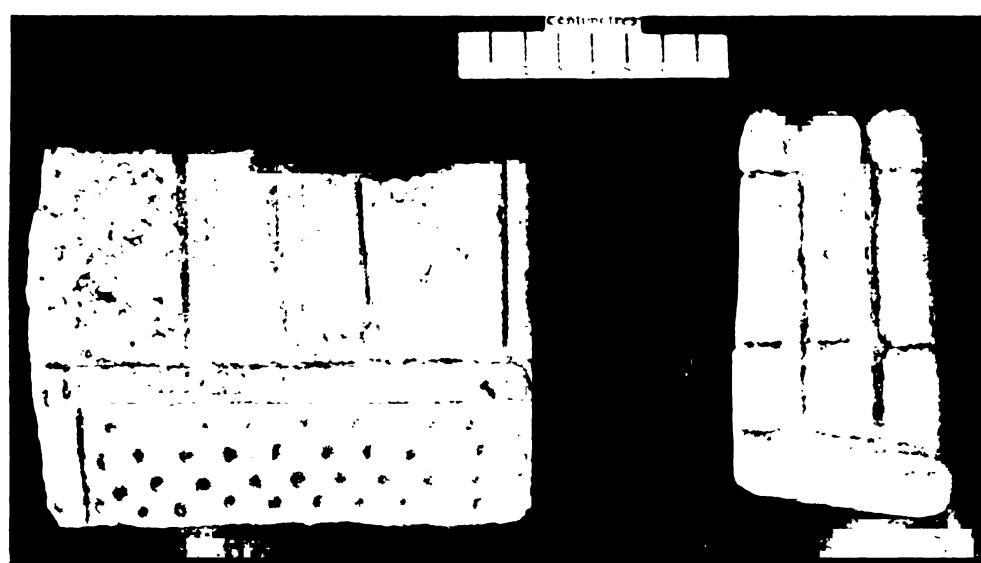


Fig. 2. Symbolical objects

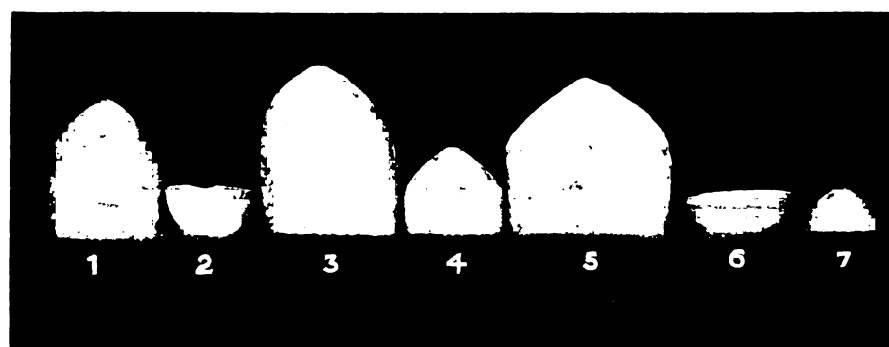


Fig. 3. Conical stones probably used as objects of veneration

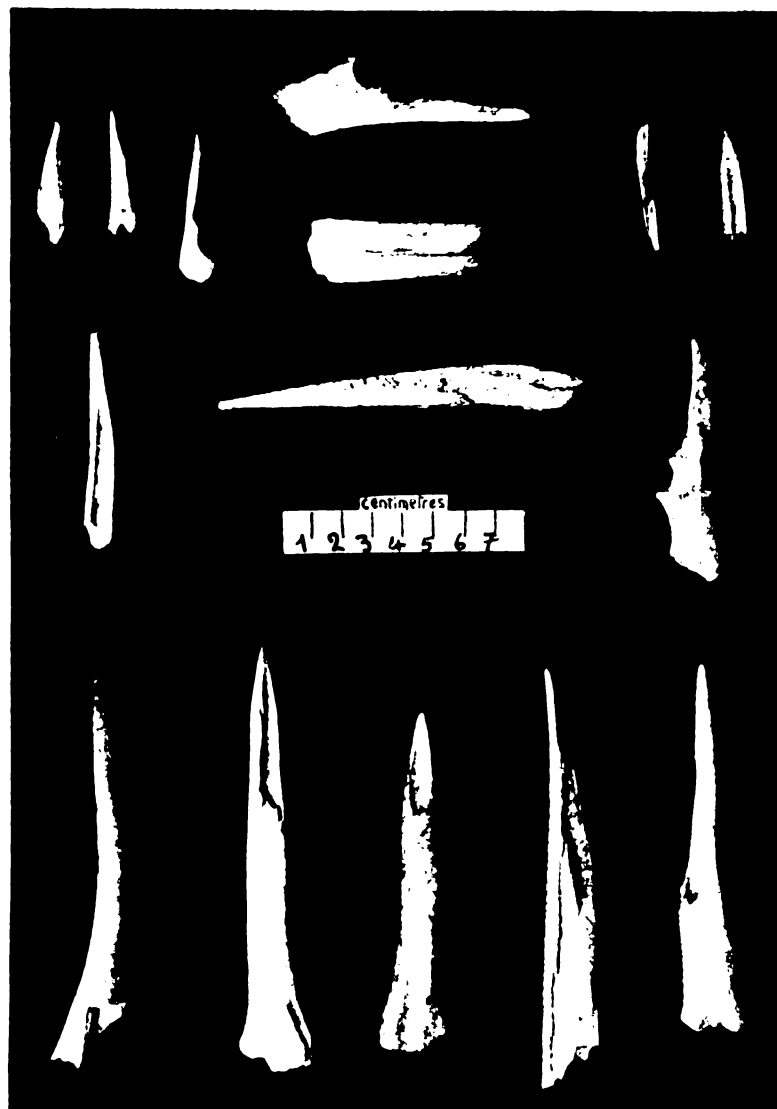


Fig. 1. Neolithic bone borers and burnishers



Fig. 2. Neolithic amphorae



Fig. 1. Neolithic amphorae *in situ*



Fig. 3. Neolithic jar



Fig. 2. Neolithic bowl

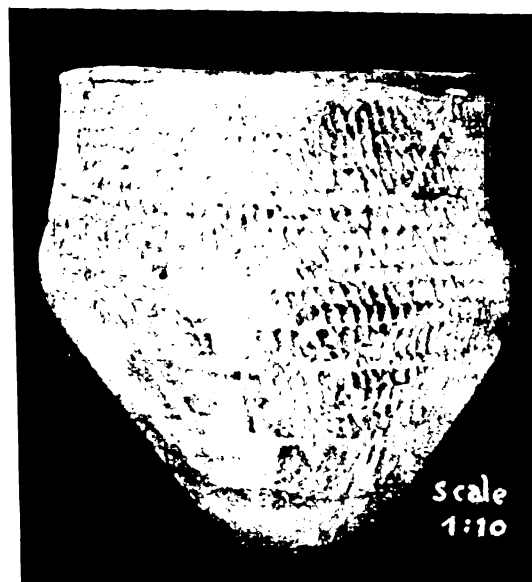
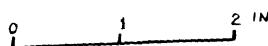
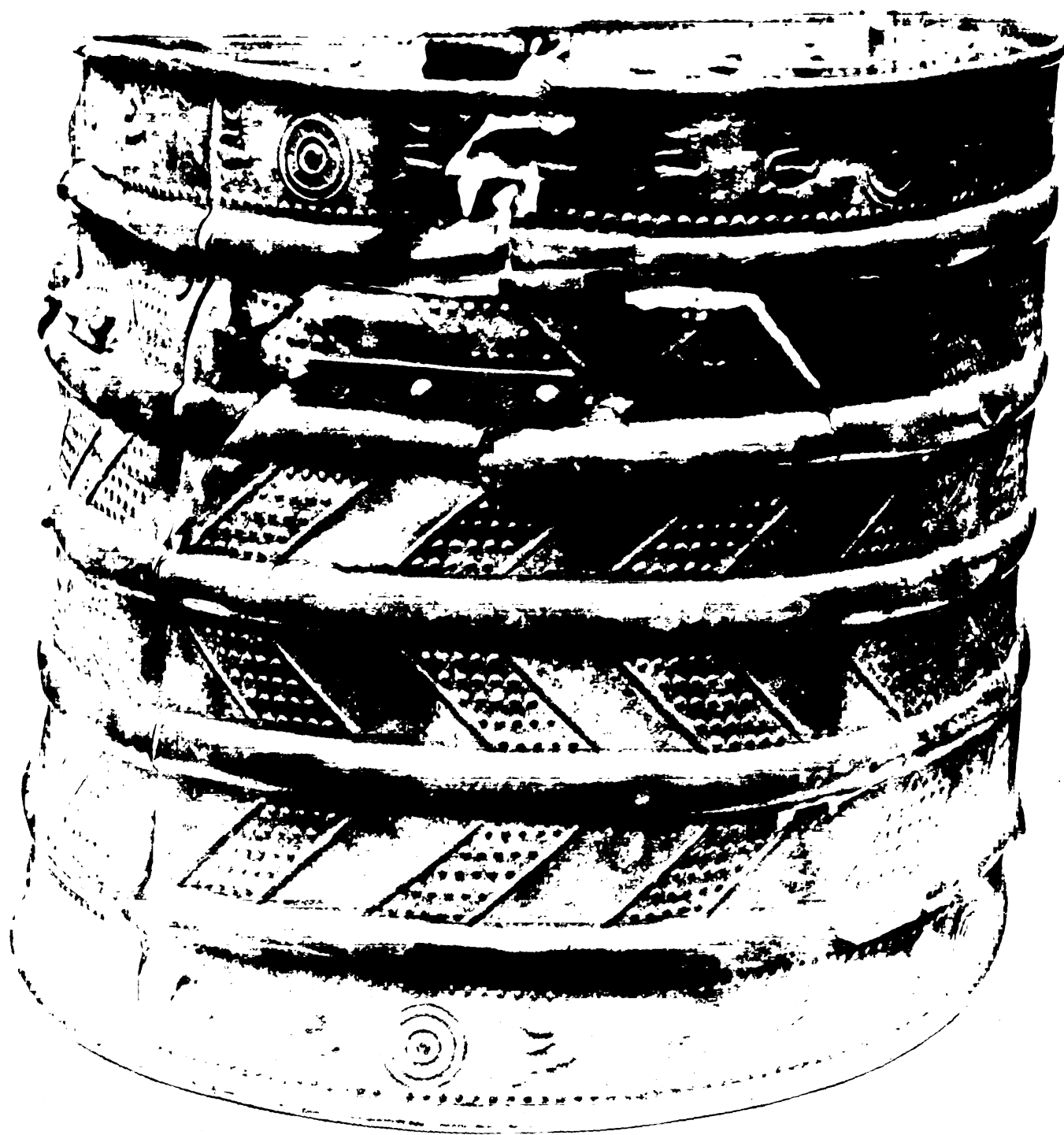


Fig. 4. Neolithic jar



Embossed bronze bucket, the handles missing, from the Hallstatt cemetery, Upper Austria

Published by the Society of Antiquaries of London, 1916

VII.—*On a Collection of Antiquities from the Early Iron Age Cemetery of Hallstatt, presented to the British Museum by LORD AVEBURY, 1916. Introduction and Inventory by SIR C. HERCULES READ, LL.D., F.B.A., Vice-President; Notes and Chronology by REGINALD A. SMITH, Esq., F.S.A.*

Read 25th May 1916.

INTRODUCTION

THE important series of antiquities that forms the subject of this communication was discovered at Hallstatt in the Salzkammergut, Austria, about the year 1869. The exploration was undertaken at the instance of Sir John Lubbock (afterwards Lord Avebury), and it is believed that a journal was kept of the daily results, as appears to have been the case in all instances where authorized digging took place on the site. Unluckily in the interval between 1869 and the present time the journal referring to Lord Avebury's exploration has disappeared, and we thus lack an important part of the information that it should have furnished, viz. the indications as to what objects were associated together, and whether the interments to which they belonged were by cremation or by inhumation. While this loss is much to be regretted, yet the absolute value and importance of the series is still very great, both as typical of the period which stands prominent as the classical example of a cultural turning-point in the history of the arts, and as filling a very serious gap in the evolutionary series in the national collection.

I have known the collection for a great many years, and realizing how inadequate in the British Museum series was the group representing the Hallstatt period I had always hoped that Lord Avebury's small collection would some day find its way to supplement it. I am happy to say that this has now come to pass, through the kind intermediation of Dr. Montagu Lubbock, and the whole of the Hallstatt series acquired by the late Lord Avebury has been presented to the British Museum by his son, and students of the Early Iron Age will now find a worthy and well-proportioned representation of the evolution of that fascinating period at the Museum.¹

From the year 1846, when the exploration of the cemetery at Hallstatt was begun, the importance of the site soon became evident, and the examination of the ground was systematically pursued till 1864 by Georg Ramsauer, director of the salt mines, on behalf of the Vienna Museum. From that year up to the

¹ In the sixties a small number of fragmentary relics from Hallstatt were presented to the Museum by Sir John Lubbock, Sir J. Evans, and Herr Ramsauer.

present time publication has done its best to bring before the world and to explain the unique value of the discoveries. An account of the early stages of the exploration and a bibliography are given in the admirable work of M. Joseph Déchelette, *Manuel d'archéologie*, ii, part 2, p. 601. In this book, moreover, our distinguished colleague, whose premature death in the battlefield we shall long regret, has given so complete and systematic an account of the Hallstatt civilization as demonstrated by the relics discovered, that it is hardly necessary to do more than refer to his pages. Relics of the period are, however, seldom found in our own country, and Continental examples are so poorly represented in our museums, that it seems worth while to set out in some detail a description of the pieces composing the series given by Lord Avebury.

INVENTORY OF THE COLLECTION

Pl. XXVII.

Bucket (cist) of thin hammered bronze, the lip and foot strengthened by lapping over to form a tube ; five embossed rounded ribs (cordons) ($\frac{3}{4}$ in. wide) with broad zigzag bands with dots between them round the body. At top and bottom a band with row of punched dots on either edge and ornamented with swans and wheel-like circles, four swans between two wheels, and in one case at top, two at bottom, two swans only. Above the second cordon are fixed, with pyramidal rivets, two flat bars ornamented with concentric circles, the only remains of the curved handles. The bucket is composed of two sheets of bronze about $21\frac{1}{2}$ in. long (i.e. horizontal) and about 12 in. wide (vertical). The ends overlap in a vertical join of about $\frac{3}{4}$ in., and are fastened by twelve well-made rivets flush with outside surface. This operation appears to have preceded the embossing of the ornamental design, though the design at top and bottom may have been hammered on the flat bronze sheet. It appears probable that a punch was made for stamping the swans, each at a blow, and the wheels in like fashion, though the radial lines of the latter were added later. The bottom of the bucket is formed of a separate circle, the edge being lapped over the vertical edge of the side of the vessel and lying flat against it, so as to produce a foot rim about an inch in height ; the bottom is convex from about an inch from the sides, the centre bossed and forming an omphalos of $5\frac{1}{4}$ in. diameter. The bottom is made fast by four rivets, with square washers, passing through the sides.

The vessel has been damaged and repaired in one place on the side, and the edge of the omphalos has cracked and been riveted. Buckets of this type are of very rare occurrence at Hallstatt, and this is the only one of the kind in this country. Cf. von Sacken, *Das Grabfeld von Hallstatt* (Vienna, 1868), pl. xxiii, 1.

Fig. 1. Remains of a dagger, with bronze handle and chape and iron blade.

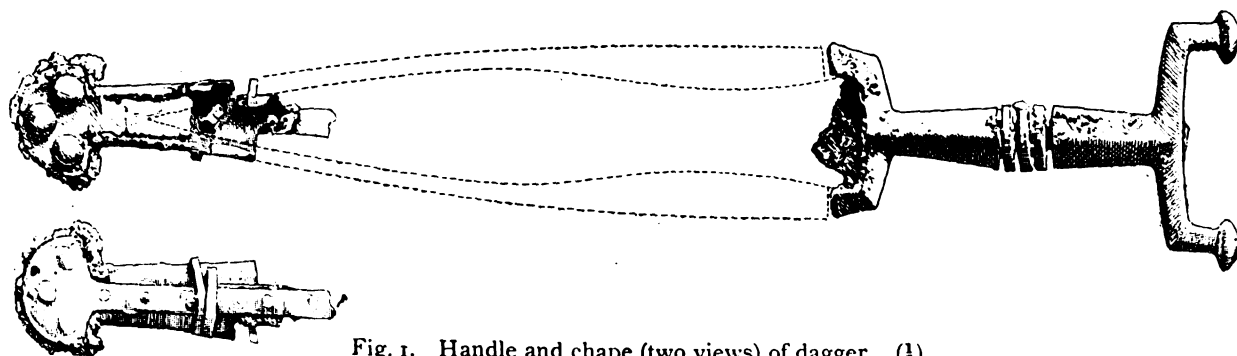


Fig. 1. Handle and chape (two views) of dagger. (1/3)

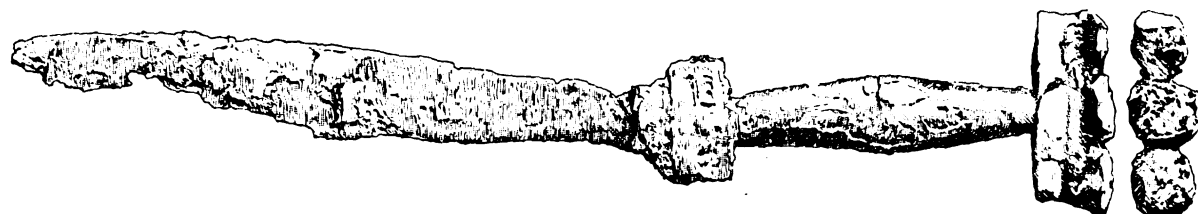


Fig. 2. Iron dagger, with top view of pommel. (1/3)

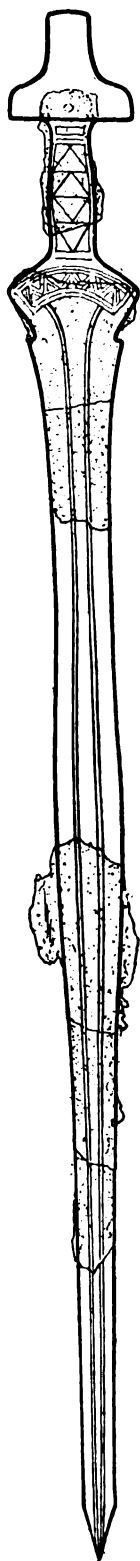


Fig. 3. Portions of iron sword, with restoration. (1/3)

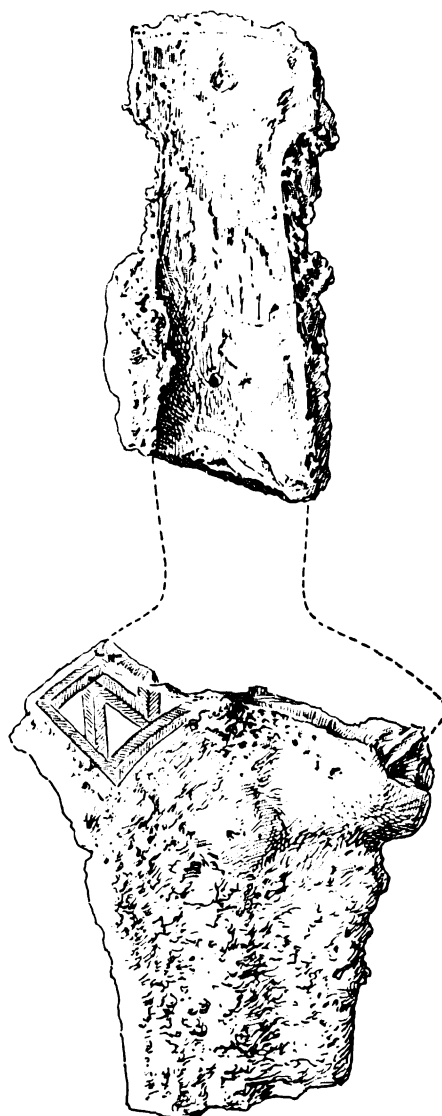


Fig. 4. Part of iron sword, with gold-foil in position. (3/3)

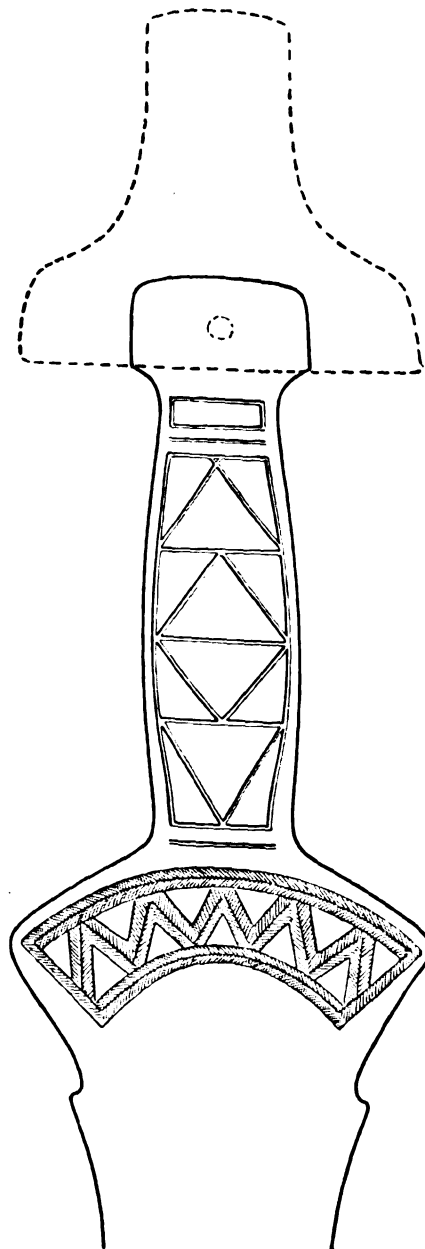


Fig. 5. Diagram of gold-foil on iron sword. (3/3)

The handle is practically complete. It has a rounded grip 2.64 in. long and 0.71 in. in diameter in the middle, where it is ornamented with three discs of iron through which, as well as through the whole length of the handle, the tang of the blade passes. The pommel is in the form of two horns at nearly right angles to the grip, forming a bar 2.3 in. wide, the ends curving upwards and each terminating in a round flattened knob. The base of the handle expands into a similar form (1.7 in. in diameter) and holds the remains of the iron blade. This is nearly rusted away. The sheath has been of a perishable material, iron, wood or leather, and only the chape remains, formed of thin bronze plates of a flattened tubular form, expanding at the end into a semicircular case, ornamented in front with three large rounded bronze knobs. It is difficult to estimate the original length of the whole, but it was about 12½ in. The length of the handle is 4⅜ in. Cf. von Sacken, pl. vi, 5.

Fig. 2. Dagger, entirely of iron. Rounded grip expanding in the middle, 3.2 in. long; pommel and transverse bar with three circular rivets at end. The blade has had a square shoulder and a leaf-shaped outline, now much rusted. Total L. 11.4 in.

Figs. 3-6. Remains of iron sword of Bronze Age type. All that remains of the handle is a flat grip of undulating outline, familiar in the swords of the Bronze Age, with a rivet hole near the pommel and another in the middle. On the surface are indications of fibre of wood or bone running longwise on one face, somewhat diagonally on the other. The lower part of the handle is lost. The shoulders of the blade are again of Bronze Age type, and the indications of the arched form of the lower part of the bone or wood mount of the grip are clearly seen, fixed by a rivet in the corner of the shoulder. The grip has evidently been covered with gold-foil, ornamented with indented herring-bone and other designs of diagonal lines. Under this part of the sword, as it lay in the grave, was a wooden object of some kind, for a portion of the gold-foil from the handle still adheres to a shapeless thick mass of wood, and another piece of wood adheres lower down the blade. Other portions of the gold-foil have become detached from the metal, and these are replaced in the restoration in the illustration. What remains of the blade is now in four pieces, with a gap between the hilt and the middle, and the point is wanting. Indications remain to show that down the middle was a broad rib with a smaller rib on each side. The nearest analogue in von Sacken is seen in his pl. v, 1, and in all probability the pommel resembled that there seen.

Fig. 7. Pommel of a sword, of ivory. It is in the form of a depressed sphere, through which the tang of the sword has passed, and made fast by a circular iron disc on the top. Around the circumference

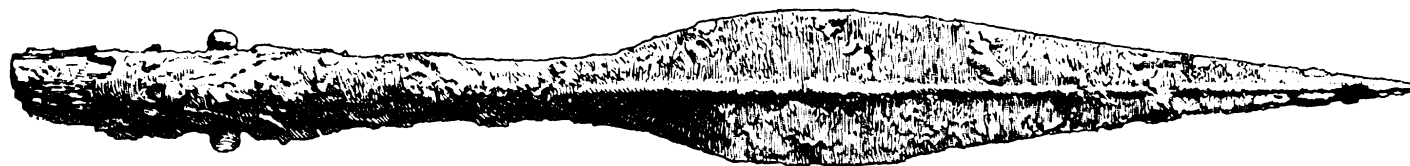


Fig. 8. Iron spear-head, with pin in socket. ($\frac{1}{2}$)

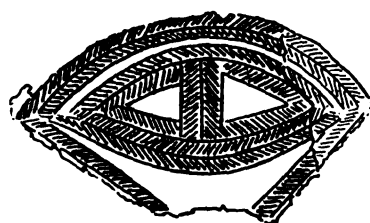


Fig. 6. Gold-foil, perhaps from sword pommel. ($\frac{1}{3}$)

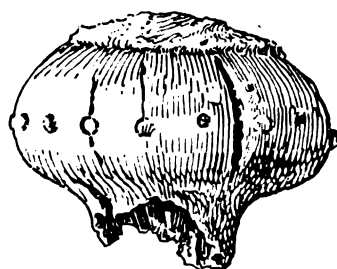


Fig. 7. Sword pommel of ivory, side and top view. ($\frac{1}{2}$)

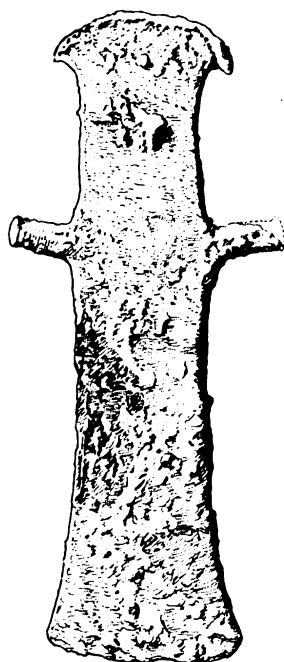


Fig. 9. Iron celt, with lateral projections. ($\frac{1}{2}$)

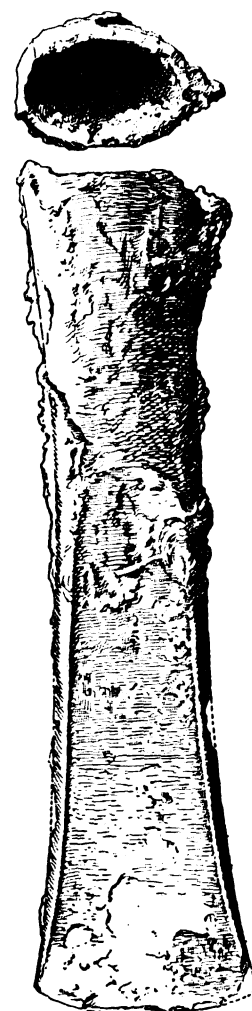


Fig. 10. Socketed celt of iron, with top view. ($\frac{1}{2}$)

of the pommel are a number of iron nails, which probably held an ornamental band. Diam. 1.7 in.

Fig. 8. Spear-head of iron, of elegant leaf-shaped outline, flattened lozenge-shaped section with midrib. The end of the wooden shaft still remains in the socket, held in place by iron rust, and the two bronze heads of the rivet fastening the shaft are still in place. At $1\frac{5}{8}$ in. below there is the impression of a bronze band $\frac{5}{16}$ in. wide, that has once ornamented the shaft. L. 14.5 in. The plates of von Sacken do not show any spear comparable with this for elegance of outline. Crescent-shaped knife of iron, squared back and short tang. L. 5.72 in. Cf. von Sacken, pl. xix, 1.

Fig. 9. Iron celt or flat axe blade. A thin flat plate of iron, curving outwards from the middle to the cutting edge; above the middle a peg standing out from each edge, and above these the edges again curve outwards, forming a crescent-shaped butt. In the middle of the butt a rivet projects. L. 6.8 in. Cf. von Sacken, pl. vii, 16.

Fig. 10. Socketed adze or axe of iron. The blade is carefully hammered to produce a slight flange at the edge of either face; long oval socket. L. 8.7 in. This specimen may well have an ear and a curved mouth to the socket, as shown in the figure. Cf. von Sacken, pl. vii, 19.

Iron palstave. Blade slightly expanding towards the cutting-edge, the butt hammered so as to produce two pairs of flanges nearly meeting over the shaft. Remains of the latter are still to be seen in place. Much rusted. L. $6\frac{1}{4}$ in.

Iron palstave; flat blade expanding towards the edge; the butt hammered into two incurved flanges on each face. Cutting-edge rusted away, but the greater part of the butt in good preservation. Cf. von Sacken, pl. vii, 13. L. $5\frac{1}{2}$ in.

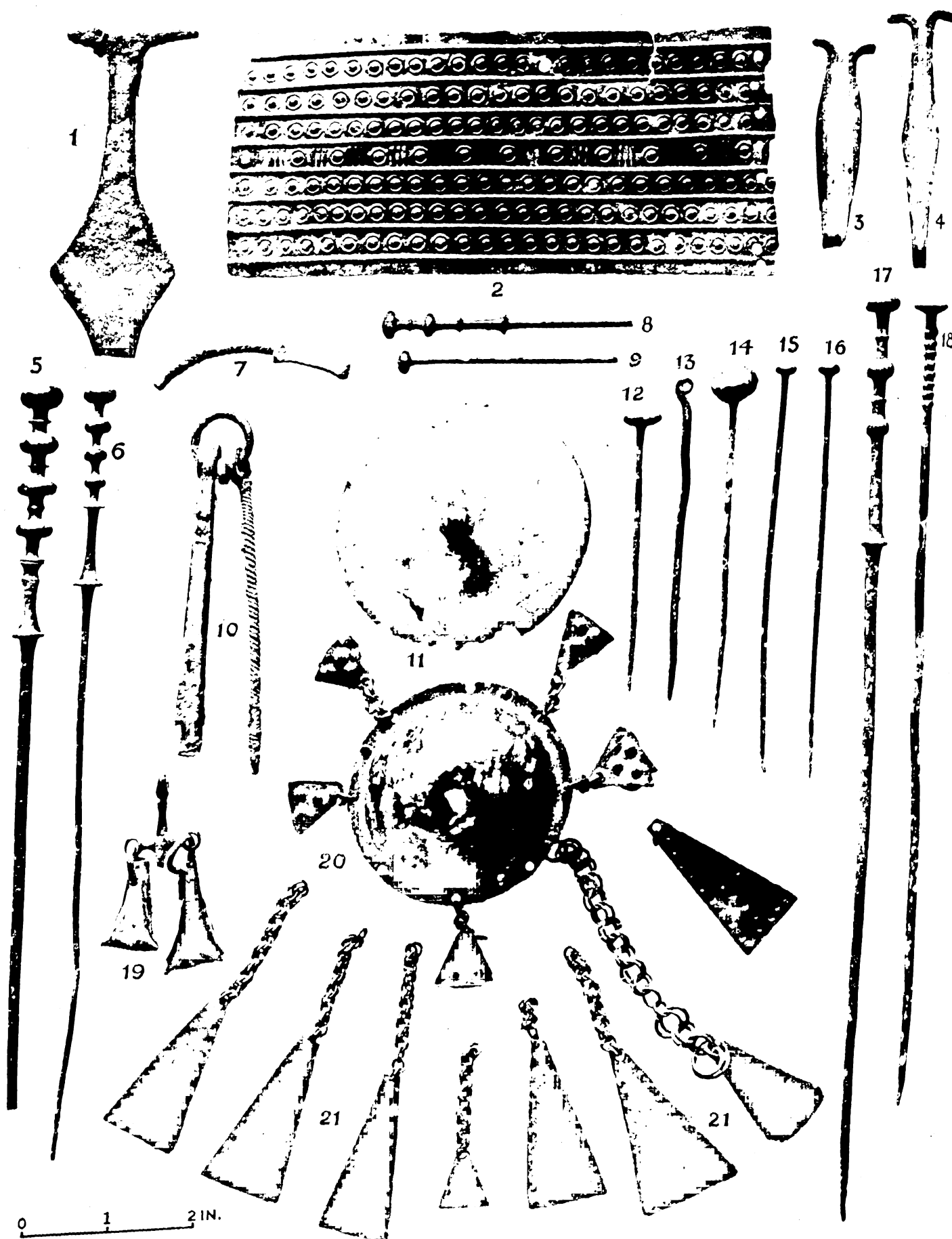
Iron palstave of same type, but sides straight, and remains of wooden shaft in butt. L. $5\frac{7}{8}$ in.

Iron palstave (type von Sacken, pl. vii, 16), rather slender in proportion, one projecting ear missing. L. $7\frac{1}{4}$ in.

Pl. XXVIII, fig. 20. Bronze flattened sphere formed of two basins with projecting edge, with a hole in the middle through which something (a pin?) has passed. The projecting edges are riveted together, and from them hang five chains with triangular plates punched with dots (three others missing). Diameter of sphere 2.4 in. An enigmatical object. The general construction recalls some of the fanciful brooches shown in von Sacken (pl. xiii-xv).

Pl. XXVIII, fig. 21. Bronze—a number of pendants of the same type as those on the foregoing object, but larger (about 2 in. long) and punched with dots in the same way.

Pl. XXVIII, fig. 19. Bronze pendant. It consists of a cruciform stem, from which hang by rings two bent-up cases of bronze plate of a triangular shape. L. 2.2 in. Cf. von Sacken, pl. xiii, 5; pl. xvii, 5.



Objects of bronze and an iron clasp (fig. 1) from the Hallstatt cemetery. (3)

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A common feature to be seen in the ornamental objects from Hallstatt is a number of small triangular pendants, sometimes embossed with punched dots. In itself the form of these is hardly decorative, but it may well be that it is symbolic or imitative. In relation to this possibility it may not be amiss to refer to a recent paper by Professor R. S. Conway on 'Some votive offerings to the Venetic goddess Rehtia'.¹ These finds, dating from third century B.C., were made close to the town of Este, near Padua, and include a number of bronze inscribed tablets and of votive nails, also inscribed. Some of these latter have pierced ears at the head, and fastened in these by rings are triangular pendants practically identical with those found at Hallstatt, as seen on sundry specimens in the present collection (e.g. pl. XXVIII, 20). Dr. Conway makes the suggestion, in deference to the manifestly votive character of the Este nails, that it may well be that the otherwise inexplicable triangular pendants have a quasi-religious or symbolic purpose, and may represent the wedges which, with nails, were attributed to the Etruscan goddess known to the Romans as Nortia.² The Hallstatt people had a great feeling for beauty of line, and a strong decorative instinct. It would have been easy for them to make these pendants more graceful in their contours, if there had been no reason for preserving the simple triangular form; but it is preserved, and the suggestion of the symbolic wedge is worth keeping in mind.

Portion of a bronze belt, with bosses of two sizes, the larger a group of five, surrounded by curved bands of small dots, each band consisting of three lines. (Cf. von Sacken, pl. ix, 6.) The belt has been much damaged and repaired by riveting plates on the back. W. $4\frac{1}{4}$ in.

Two portions of a bronze belt, a plain band of hammered bronze $2\frac{7}{16}$ in. wide, the outer face carefully planished. At one point are two ornamental bosses fixed by rivets (originally three). Present length $20\frac{1}{2}$ and $15\frac{1}{2}$ in.

Two portions of a bronze belt, a plain band of hammered metal $2\frac{3}{8}$ in. wide. The end of one portion is strengthened by an added plate of bronze, held by three ornamental bosses fixed by rivets; on the other portion one similar boss alone remaining. Present length about 7 and $6\frac{1}{4}$ in.

Pl. XXVIII, fig. 2. Portion of a bronze band ornamented with seven longitudinal rows of dots within circles; in the middle line the circles alternate with groups of three transverse lines. One end has been broken and repaired by rivets now gone. L. $6\frac{1}{4}$ in.; W. $2\frac{3}{4}$ in.

Bronze circular cover of a vase(?). It is made of exceedingly thin hammered metal, concavo-convex, having in the centre a small point as a handle, held inside by a washer. Diam. $5\frac{1}{16}$ in. Cf. von Sacken, pl. viii, 11.

¹ *Journal Anthropol. Inst.*, vol. xlv, p. 221.

² Horace, *Odes*, i, 35, 18.

Armlets.

- Pl. XXIX, fig. 12. Bronze penannular armlet for upper arm; the outer face modelled in a series of knobs divided by ribs. Diam. 4.85 in.
Bronze penannular armlet, similar. Diam. $5\frac{1}{8}$ in.
- Pl. XXIX, fig. 2. Bronze penannular armlet, brilliant dark green patina ornamented with groups of serrated lines; ends slightly expanding. Diam. 4.3 in.
- Pl. XXIX, fig. 7. Child's penannular armlet of bronze, overlapping ends, the outside ribbed. Diam. 1.8 in.
Bronze penannular armlet, plain, oval section. Diam. 3 in.
- Pl. XXIX, fig. 4. Bronze penannular armlet, ribbed outside. Diam. 2.6 in.
- Pl. XXIX, fig. 1. Bronze penannular armlet, thin, plain. Cf. von Sacken, pl. xvi, 19. Diam. 2.7 in.
Bronze penannular armlet, divided into bosses outside. Diam. 2.4 in.
Bronze penannular armlet, hollowed inside; the outside with transverse ribs of several sizes. Diam. 2.5 in. Cf. von Sacken, pl. xvi, 9.
- Pl. XXIX, fig. 13. Bronze penannular armlet, smooth turquoise patina, diminishing to ends; broad transverse ribs alternating with pairs of small ones. Diam. 2.6 in. Cf. von Sacken, pl. xvi, 18.
Half of bronze penannular armlet, hollow inside, outside ribbed; diminishing to end. L. 2.4 in.
Portions of bronze penannular armlet, cut in deeply divided sections, pointed oval alternating with knife-like bars (in four pieces). Cf. von Sacken, pl. xvi, 12. W. of largest piece $4\frac{1}{8}$ in.
- Pl. XXIX, fig. 3. Half of bronze penannular armlet of similar type to last (pl. xvi, 12). L. $3\frac{1}{8}$ in.
- Pl. XXIX, fig. 9. Bronze penannular armlet, globular pellets alternating with knife-like ribs. Cf. von Sacken, pl. xvi, 11. Diam. 3.2 in.
- Pl. XXIX, fig. 10. Bronze penannular armlet, like the last, but damaged (pl. xvi, 11). Diam. 3.2 in.
- Pl. XXIX, fig. 8. Bronze penannular armlet, like the last. Diam. $2\frac{7}{8}$ in., fine smooth patina in parts.
Bronze penannular armlet (broken), like the last, but brilliant pale green patina. Diam. $3\frac{1}{2}$ in.
Bronze penannular armlet (broken), same type as last, but much oxidized and rough surface. Diam. $2\frac{3}{4}$ in.
- Pl. XXIX, fig. 5. Bronze penannular armlet, similar, but flat on the inner side. Diam. 2.6 in.
Bronze penannular armlet, ornamented with knobs, only without the intervening blade-like ribs. Diam. 2.8 in.
Portion of bronze penannular armlet of similar type, but with a pair of sharp ribs alternating with the knobs. L. $2\frac{1}{2}$ in.
- Pl. XXIX, fig. 11. Hollow bronze armlet with opening round the inside, one end fitting into the other; with three rows of bosses around the outside. Diam. 3 in.

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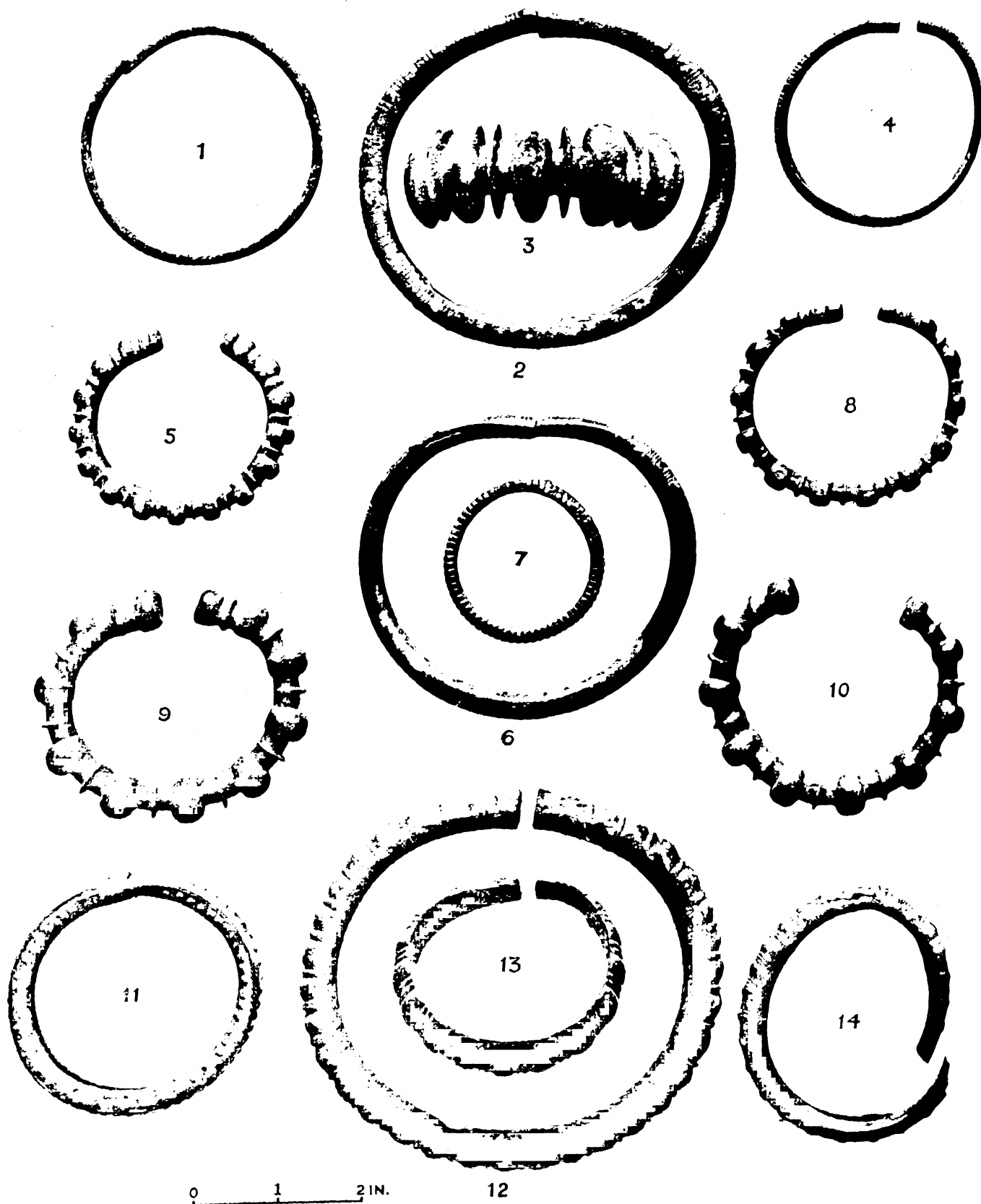
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P. U. L.—Form 3



Bronze armlets and bracelets from the Hallstatt cemetery

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- Pl. XXIX, fig. 14. Hollow bronze armlet with opening round the inside; embossed with broad ribs alternating with groups of smaller ones. Diam. 2.9 in.
Hollow bronze armlet with narrow opening round the inside; outside ornamented with groups of narrow transverse lines. Diam. $3\frac{7}{8}$ in.
- Pl. XXIX, fig. 6. Hollow bronze armlet, similar; defective. Diam. $3\frac{7}{8}$ in.
- Fig. 11. Five bronze anklets, each formed of a penannular flat bar bent into an oval and curved on its longitudinal plane. Each is ornamented with five panels of diagonal cross-hatching with dot and circle between. Diam. 4 to $4\frac{5}{8}$ in. Not represented in von Sacken; but a set arranged as worn on the ankle is figured in *Festschrift zum XLIV Anthropologen-Kongress, Nürnberg, 1913*, pl. 34.
Half of a similar anklet, with alternating diagonal lines. W. $4\frac{1}{8}$ in.
Bronze penannular anklet, ends overlapping and slightly expanding; body increasing in bulk to the middle and ornamented with transverse lines. Diam. 3.1 in.

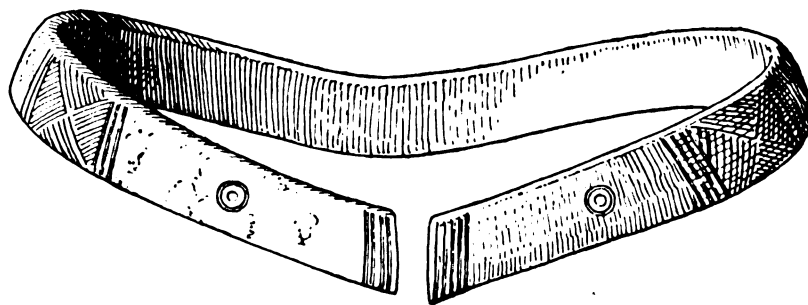


Fig. 11. Bronze anklet, one of a set. (†)

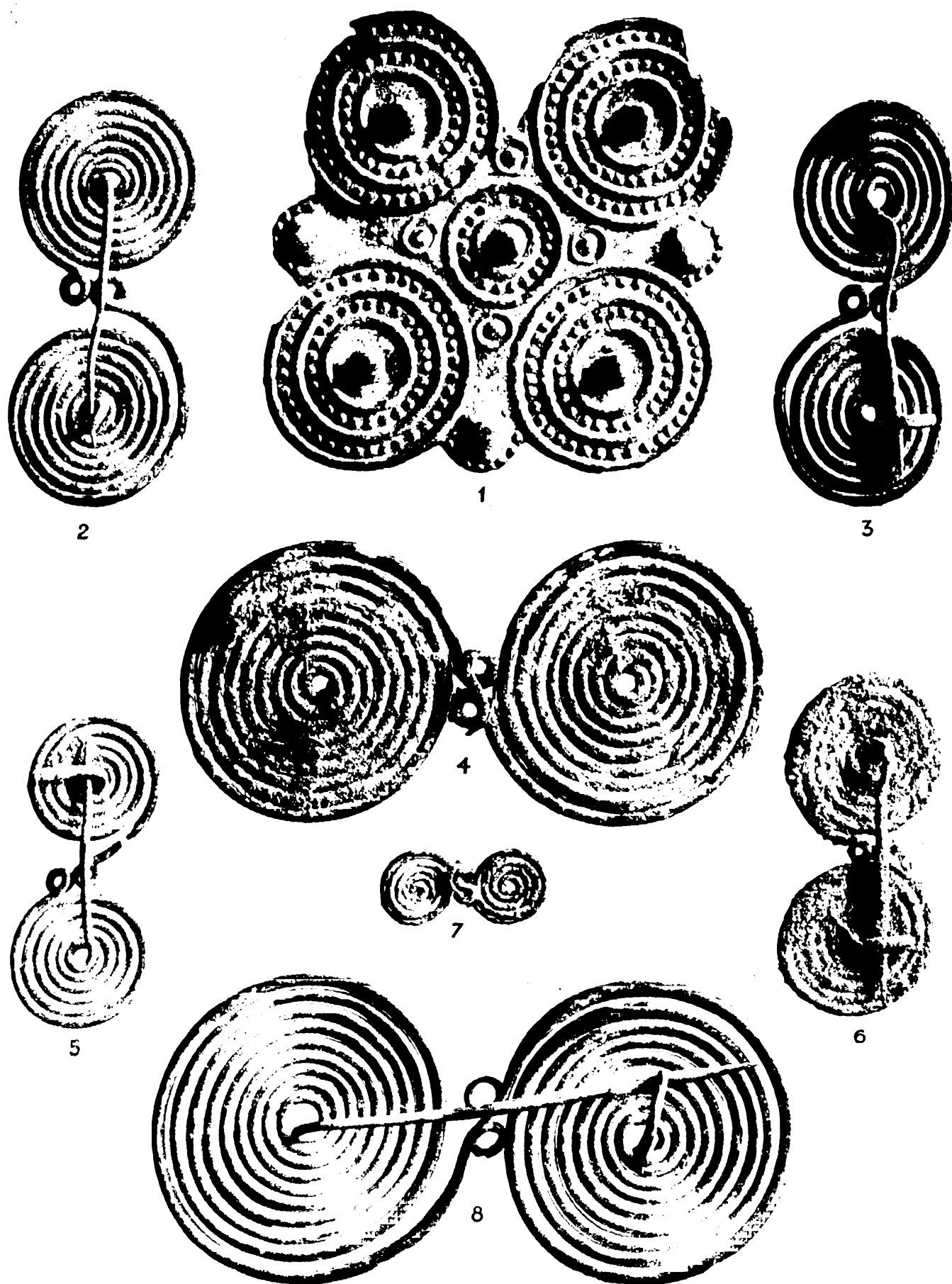
- Pl. XXVIII, fig. 3. Bronze girdle-hook, a fish-shaped plate with hook at one end and fish tail at the other. L. $2\frac{1}{4}$ in. Cf. von Sacken, pl. xviii, 28.
- Pl. XXVIII, fig. 4. Bronze girdle-hook, green patina with zigzag band across the back. L. 2.8 in.
Iron portion of a girdle-hook; T-shaped end with curved sides, below expanding towards an angular form. L. $4\frac{1}{4}$ in.
- Pl. XXVIII, fig. 1. Iron portion of a girdle-hook; the end is split into two points, and below is a curved outline developing into a lozenge shape. Cf. von Sacken, pl. xi, 10. L. $3\frac{5}{8}$ in.
Iron portion of a girdle-hook, similar to last. L. $1\frac{5}{8}$ in.
Ingot of iron, oblong, $2\frac{3}{16}$ in. by $1\frac{1}{2}$ in. and about $\frac{3}{8}$ in. thick; one face flaked away, the other has lain upon a leaf and has produced a minute cast of all its characters.
- Pl. XXX, fig. 8. Bronze double spiral brooch formed of a single piece of wire. L. $4\frac{1}{2}$ in. Cf. von Sacken, pl. xiii, 9, 9^a.
- Pl. XXX, fig. 6. Bronze similar brooch, smaller. L. 2.4 in.
Another similar, broken and catch wanting. L. $3\frac{3}{8}$ in.

154 COLLECTION OF ANTIQUITIES FROM HALLSTATT

- Pl. XXX, fig. 4. Another similar, pin wanting. L. $4\frac{1}{8}$ in.
 Pl. XXX, figs. 2, 3. Pair similar, complete. L. 2.8 in.
 Pl. XXX, fig. 5. Another similar. L. $2\frac{1}{8}$ in.
 Pl. XXX, fig. 7. Another similar, pin wanting. L. 1.2 in.

The so-called 'spectacle brooches' are of most ingenious construction, formed of a single piece of wire wound upon itself so as to form two circles of spirals, one end of the wire left straight and pointed so as to serve as the pin of the brooch, fitting into a catch formed of the other end of the wire. It is improbable that so peculiar and characteristic a device had independent origin in more than one spot, and one must assume a connexion between such brooches, whether found at Hallstatt, or as they are found, in Southern Italy, or in Boeotia, where it seems most likely that they preceded the more northern discoveries.

- Fig. 12. Bronze brooch with two coils on one side of the head; the bow arched, with two pellets flanking the summit; ornamented with transverse lines and punch-marks; the catch-plate long. L. 4.1 in.
 Fig. 13. Bronze brooch, with broad flat bow diminishing to the foot, where it is doubled into a guard and ends in a moulded knot; all in one piece. L. $3\frac{3}{4}$ in.
 Fig. 14. Bronze boat-shaped brooch, with three transverse bands of cross-hatching on the bow, and plain transverse bands at its two ends; double coil on one side of the head and the foot-plate missing. L. of pin, 2.8 in.
 Fig. 15. Bronze brooch, with long spiral spring and chord passing under the head; dished bosses on the bow and foot; a variety of the kettle-drum type. L. 1.2 in.
 Fig. 16. Bronze brooch of Certosa type, pin wanting. L. 2.3 in.
 Fig. 17. Bow of bronze brooch of cushion type; hollow inside. L. 1.1 in. Cf. von Sacken, pl. xiv, 4, for type.
 Pl. XXVIII, fig. 10. Bronze plain ring on which are two toilet implements, a pair of tweezers (one end wanting), and a nail pick, with spiral stem. L. of the latter, $3\frac{5}{8}$ in.
 Bar of bronze from a 'girdle-hanger'; a straight round bar with broken part of a ring at right angles; through the other end is threaded a stout wire ring. L. 3.2 in. Cf. von Sacken, pl. xii, 13.
 Bronze earring; a circle of thin bronze tubing, penannular, diminishing towards the ends. Diam. 2.1 in. Cf. von Sacken, pl. xvii, 4, 6. Another, similar. Diam. 2.0 in.
 Fig. 18. Bronze pin 0.22 in. thick in middle; the head ornamented with four flattened spheres and terminating in a disc; below the sphere is a rib, and the pin expands and then diminishes to the point. Here is



Brooches of 'spectacle' type and embossed plate (fig. 1), from the Hallstatt cemetery. (Slightly enlarged)

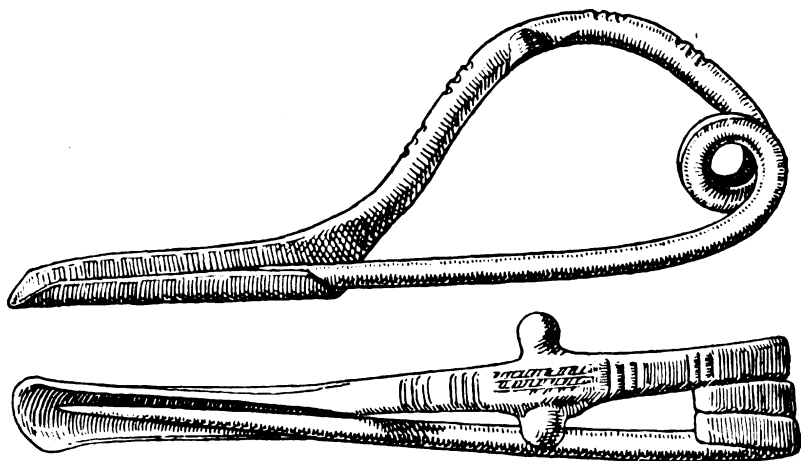


Fig. 12. Bronze brooch, side and top views. (1)

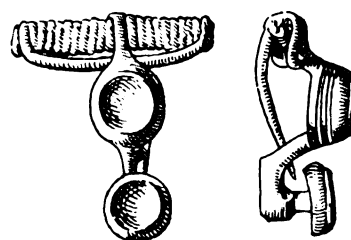


Fig. 15. 'Kettle-drum' brooch, front and side views. (1)

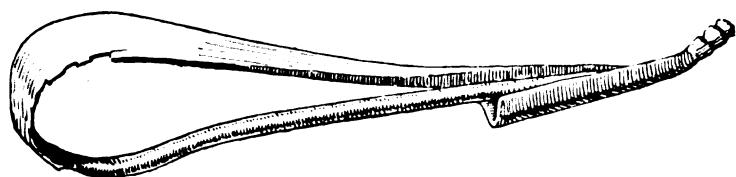


Fig. 13. Brooch without spiral spring, side and top views. (1)

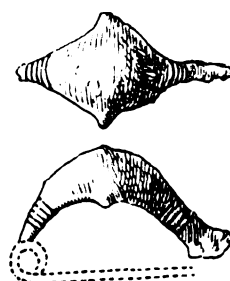


Fig. 17. Bow of 'cushion' brooch, top and side views. (1)

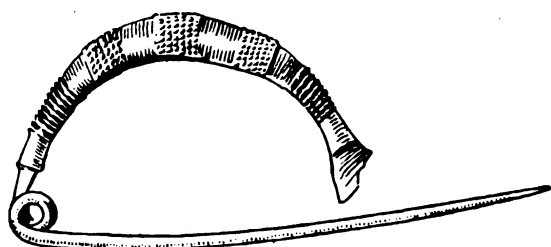


Fig. 14. Bronze bow brooch, foot wanting. (1)

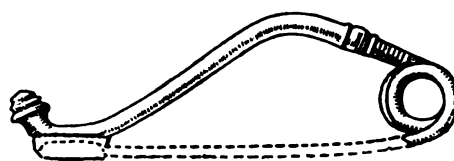


Fig. 16. Brooch of Certosa type, pin missing. (1)

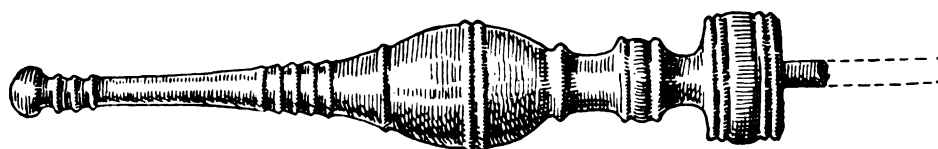


Fig. 19. Baluster head of pin. (1)

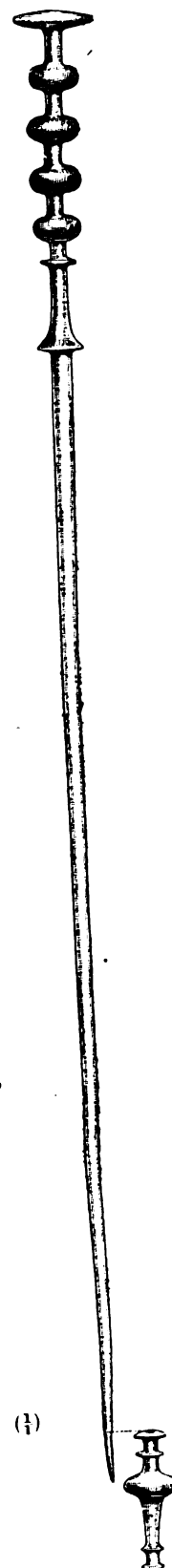
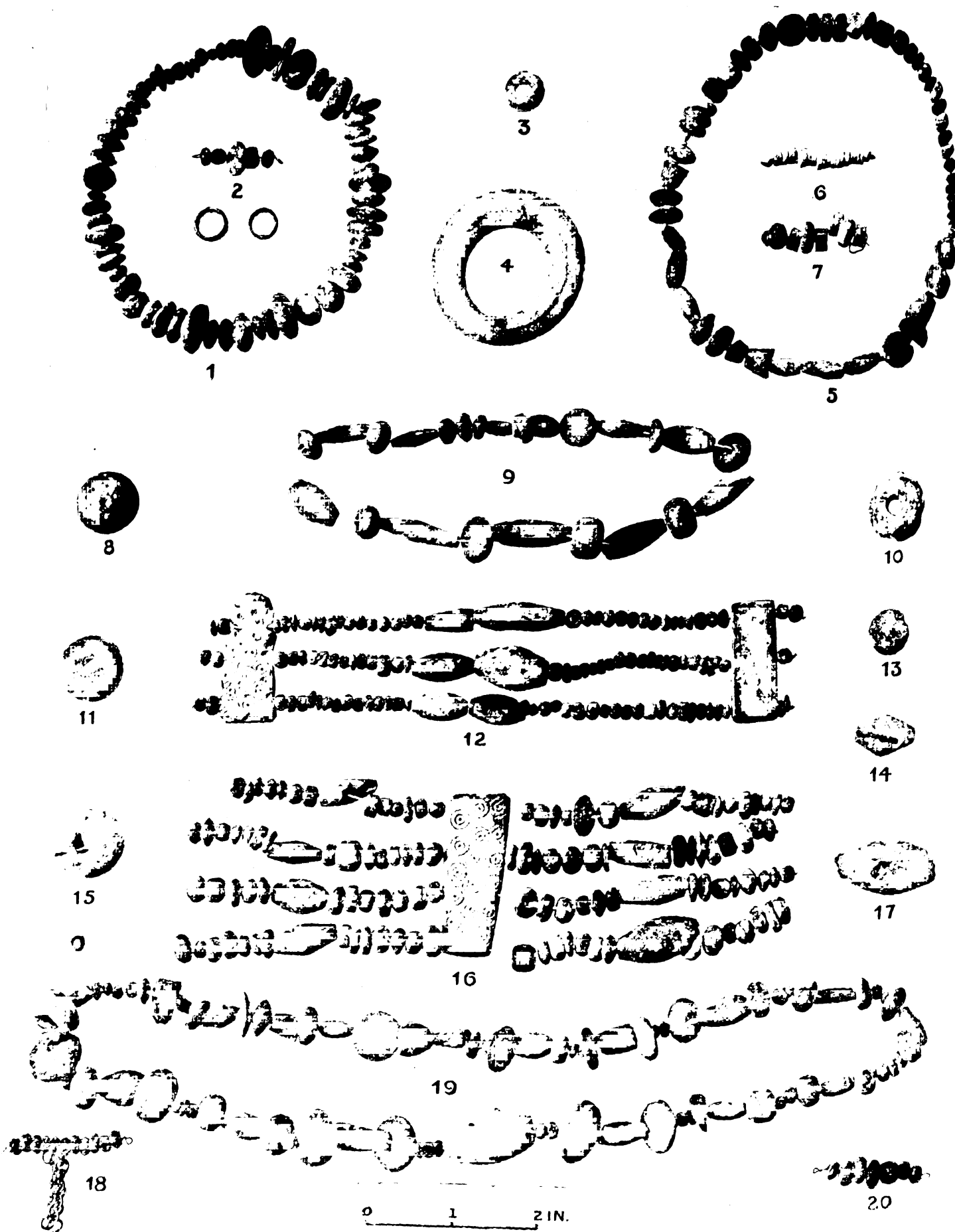


Fig. 18. Bronze pin, with point protector. (1)

- a point protector of a kind of baluster design, $1\frac{1}{2}$ in. long. Total length of pin without protector 15.9 in. Cf. von Sacken, pl. xvi, 5, 6.
- Pl. XXVIII, fig. 6. Bronze pin; ornamented head, similar to last, but without the ridges. L. 8.7 in.
- Pl. XXVIII, fig. 17. Bronze pin, similar; three spheres and two faint ridges. L. 10.3 in.
- Pl. XXVIII, fig. 18. Bronze pin; large lenticular head, below, eight shallow ribs. L. 9 in.
- Pl. XXVIII, fig. 9. Bronze, three plain pins, flattened globular heads. L. 2, 2.5 in.
- Pl. XXVIII, fig. 5. Bronze pin, ornamented head, four flattened spheres divided by sharp ridges; point broken. L. 8.1 in. Cf. von Sacken, pl. xv, 12.
- Pl. XXVIII, figs. 12, 14-16. Four bronze pins, plain; flattened globular heads. L. 4.6, 4.5, 4, 3.1 in. Cf. von Sacken, pl. xv, 9.
- Pl. XXVIII, fig. 8. Upper part of bronze pin, with two knobs near the end and three sharp ribs. L. 2.8 in. Cf. von Sacken, pl. xv, 11.
- Pl. XXVIII, fig. 13. Bronze pin with head flattened and coiled. L. 3.6 in.
- Fig. 19. Bronze butt of hairpin (?). The pin itself has been very thin ($\frac{1}{8}$ in.). The ornamental butt is of stout proportions, baluster design. L. 4.2 in. Cf. von Sacken, pl. xv, 12.
- Pl. XXX, fig. 1. Embossed plate of thin bronze, the shape derived from a spiral brooch of four coils: four groups of concentric circles each with raised dots and a high cone riveted in the centre; a smaller circle and cone in the middle and single bosses in the interstices. Iron rust at the back indicates that the plate has been fixed to an iron base. L. of side 3.1 in. Cf. von Sacken, pl. xiv, 14, and pl. xviii, 22.
- Pl. XXVIII, fig. 11. Circular cover of vase (?); a convex-concave plate highly planished outside, in the centre a loose rivet or catch with pyramidal head. Diam. 2.8 in. Cf. von Sacken, pl. viii, 11.
- Bronze spiral tube of flat wire, convex outside, diminishing slightly in diameter towards one end. L. 2.9 in. Cf. von Sacken, pl. xvii, 17.
- Boss of bronze, circular, with hole in the middle; the inside filled with a wax-like material. Diam. $\frac{3}{4}$ in.
- Stud; a convex boss of thin bronze with a pin projecting from centre of inside. Diam. 1 in.
- Mass of fragments of two stout bronze rings, mixed with fragments of smaller ones and chains. Diam. about 2 in.
- Pl. XXVIII, fig. 7. Bronze curved bar, on one end of which is stuck a tarsal bone. L. $2\frac{1}{4}$ in.
- Bronze buttons. Each is convex-concave, with a loop in the centre inside, cast in place. The diameter is about $\frac{5}{16}$ in. The outer surface has been carefully polished.
- Bronze nails with mushroom-like heads similar to foregoing. Diam. of head about $\frac{5}{16}$ in.
- Bronze buttons or studs, with a loop extending nearly from edge to edge of the convex top. Diam. about $\frac{3}{8}$ in.
- Bronze rings of various sizes. Diam. 1 in. and smaller.



Beads of amber, glass, bronze, and shell, from the Hallstatt cemetery. (3)

Flat disc of rough reddish ware, with a hole for suspension near one edge. Diam. $3\frac{3}{4}$ in.

Three fragments of brown hand-made pottery, ornamented with deeply incised cross-hatching, panels of dots, etc. Diam. about 2.3 in.

Spindle whorl, grey ware, diminishing to top. H. 0.64 in.

Penannular bone object formed of a vertebra, with wide opening; at either side are indications of the presence of a circular object of bronze, with central pin. W. $1\frac{1}{8}$ in.

Whetstone of grey slaty stone, hole for suspension at one end. To it is attached by rust a portion of a bronze plate embossed with concentric circles. L. $3\frac{5}{8}$ in. Cf. von Sacken, pl. xix, 22-24.

- Pl. XXXI, fig. 12. Triple row of amber beads, with larger ones in the middle and a cross-bar at each end. The majority of the beads are of flattened sphere shape, the large ones in the middle fusiform (flat or round). One of the cross-bars is of bone, ornamented with dots and circles; the other of amber, oblong, one face arched, pierced with seven holes. L. as strung $6\frac{3}{4}$ in.
- Pl. XXXI, fig. 16. Quadruple row of amber beads, with cross-bar of bone in middle ornamented with dots and circles. The majority of the beads are flattened spheres, among them eight larger, fusiform. L. as strung 7 in.
- Pl. XXXI, fig. 19. String of amber beads of various forms, fusiform, discoidal, flat circular, etc. L. about $22\frac{1}{2}$ in.
- Pl. XXXI, fig. 9. String of amber beads, fusiform alternating with spherical, etc. L. about $11\frac{1}{2}$ in.
- Pl. XXXI, fig. 1. String of amber beads, mostly flattened circular of various diameters. L. 11 in.
- Pl. XXXI, fig. 5. String of amber beads, mostly rounded forms with a few fusiform at one side. L. 12 in.
- Pl. XXXI, fig. 13. Amber bead, lenticular with transverse perforation. Diam. 0.5 in.
- Pl. XXXI, fig. 4. Amber ring. Diam. $1\frac{3}{4}$ in.
- Pl. XXXI, fig. 17. Amber bead, flattened fusiform. L. 1.3 in.
- Pl. XXXI, fig. 14. Another smaller and damaged. L. 0.8 in.
- Pl. XXXI, fig. 11. Amber bead, depressed sphere. Diam. 0.7 in.
- Pl. XXXI, fig. 20. Amber beads, mostly lenticular. Diam. 0.3-0.2 in.
- Pl. XXXI, fig. 15. Bone bead, irregular rounded form. Diam. 0.8 in.
- Pl. XXXI, fig. 8. Glass bead, depressed sphere, transparent light green; surface much decayed, but vitreous and not oxidized. Diam. 0.7 in.
- Pl. XXXI, fig. 10. Amber bead with angular profile. Diam. 0.8 in.
- Pl. XXXI, fig. 2. Four amber beads, and two of blue glass once inlaid, with two small bronze rings used as beads.
- Pl. XXXI, fig. 6. Twenty-two minute disc beads of shell. Diam. about 0.2 in.

158 COLLECTION OF ANTIQUITIES FROM HALLSTATT

- Pl. XXXI, fig. 7. Nine rings of bronze used as beads, many of the ends not joined.
Diam. 0.4-0.3 in.
- Pl. XXXI, fig. 3. Glass bead, plain blue, irregular. Diam. 0.4 in.
- Pl. XXXI, fig. 18. Blue glass beads, minute, with cavities outside once filled with inlay;
attached to bronze chain of double links. Diam. of beads, 0.2 in.

NOTES AND CHRONOLOGY

The part played by the bucket-type of bronze vessel in the Villanova period is thus described by M. Albert Grenier:¹ 'The *cist* is distinguished from the *situla* by its perfectly cylindrical form, having no shoulder or neck. The handles are fixed and are generally placed about half-way up. But the two types differ above all in function, the *situla* holding liquids, and the *cist* (originally) being simply a basket or box for solid objects.' It is one of the leading Bolognese types, and undergoes certain modifications in the Etruscan period, the cordons being set closer together and the spaces between them left quite plain. The fixed handles, though found sometimes in the Villanova period, are more general at the later date. That the transition took place in the Bolognese seems clear from the features common to both periods, and the perpetuation of certain Villanova peculiarities only in that area, e.g. the use of bronze plate with rivets, and the pendent ornaments on the handles. The exact date of transition from the Villanova type to the Etruscan is difficult to fix, but the occurrence of a *cist* with rhombs of embossed dots between the cordons in the Arnoaldi ground is an important clue. There is good authority for the dating of that group which constitutes the final phase of the Villanova civilization, and the earliest date for our Hallstatt specimen would therefore be the middle of the eighth century B.C. (see table on p. 159).

This particular variety of the cordoned bucket has been figured elsewhere, and approximately the same date is arrived at by examining the evidence from other sources. Professor Hoernes of Vienna has had access to the largest Hallstatt collection and Ramsauer's unpublished journal of the excavations, so that his opinion carries extra weight. At the Monaco Congress in 1906² he somewhat reduced his former estimates of the date, and equated Hallstatt I (750-600) with Este II, and Hallstatt II (600-400) with Este III, suggesting for Bologna the absolute dates given in col. 3 of table I. In 1909³ he divided the Hallstatt period into three, equivalent to the fourth, fifth, and sixth divisions (1050-500) of Professor Montelius's scheme for the Bronze Age of North Europe; and con-

¹ *Bologne Villanovienne et Étrusque* (Paris, 1912), pp. 240, 334.

² *Congrès internat. d'Anth. et d'Arch. préhistoriques: Compte rendu*, vol. ii, 75 (La Nécropole de Hallstatt: essai de division systématique).

³ *Natur- und Urgeschichte des Menschen*, ii, 243.

TABLE I—CHRONOLOGY OF THE HALLSTATT PERIOD.

<i>Italy.</i>	<i>Approximate dates for Bologna.</i>		<i>Este and Golasecca.</i>	<i>Greece.</i>	<i>W. Europe.</i>
Proto-Etruscan (1100-900)	1000-900 (1100-950, Montelius)	Benacci I (950-750, Hoernes)	Este I, Bronze Age	Geometric (11 th -9 th century)	Early Hallstatt (1000-850, Geometric)
Etruscan (900-500)	900-700 (950-750, Montelius)	Benacci II (750-600, Hoernes)	Este II, Golasecca I	Dipylon (9 th -8 th century)	Mid Hallstatt (850-650, Orientalizing)
	750-550	Arnoaldi (600-500, Hoernes)	Este III, Golasecca II	Proto-Corinthian (750-600)	
	550-400	Certosa, Etruscan (500-400, Hoernes)		Corinthian, etc. (7 th century)	Late Hallstatt (650-500, Early Greek)
	400-Roman	La Tène, Gaulish	Este IV, Gaulish	Attic black-figure (6 th century)	
See <i>Journ. Anthropol. Inst.</i> , xxvi (1897), pl. xxv-xxx.	See Déchelette, <i>Manuel</i> , ii, 539.	See Monaco Congress, 1908, <i>Compte rendu</i> , ii, 95.	See Déchelette, <i>Manuel</i> , ii, 540.	See Déchelette, <i>Manuel</i> , ii, 625.	See Hoernes, <i>Natur- und Urgeschichte des Menschen</i> , ii, 243.

TABLE II—CHRONOLOGY OF THE HALLSTATT CEMETERY.

<i>Montelius.</i>	<i>Reinecke.</i>	<i>Hoernes.</i>	<i>Déchelette.</i>
Bronze-sword (transition) period : Ronzano, antennae, and Hallstatt types (1050-850)	Period A (transition), 1200-1000	Transition from Bronze Age	
Long iron-sword period (850-600)	Period B (bronze swords), 1000-850	Bronze-sword period (from 900)	Hallstatt I (900-700)
Short-sword period (600-400)	Period C (long iron swords), 850-700	Iron-sword period (to 700)	
	Period D (short swords), 700-550	Horseshoe daggers (short swords), 700-500	Hallstatt II (700-500)
See <i>Om tidsbestämning inom Brons-åldern</i> (1885), 119-121.	See <i>Allertümer unserer heidnischen Vorzeit</i> (1911), 239, 319, 403.	See <i>Archiv für Anthropologie</i> , xxxi (1905), 281.	See <i>Manuel d'Archéologie</i> (1913), vol. ii, part 2, p. 622.

nected these phases of Hallstatt with Greek civilization as indicated in col. 6 of table I. There is still another scheme, published in 1905,¹ which includes Italy, the Alps, West and Central Europe. The western section is reproduced in table II, col. 3; and it may be added that Hallstatt itself lies on the border between his west and middle-east groups, but belongs more to the west. His eastern Hallstatt area is divided into three sections—(i) south-eastern: Istria, Carniola, S. Carinthia, and S. Styria. (ii) central: N. of eastern Alps and adjacent Danube area, N. Carinthia, N. Styria, W. Hungary, Lower and Upper Austria, S. Bohemia, and Moravia. (iii) north-eastern: Upper Palatinate, N. Bohemia, N. Moravia, Silesia, and Posen. His western Hallstatt area embraces South and West Germany, N. Switzerland, and E. France.

The distribution of Hallstatt remains in Central Europe is well shown on a map appended to von Tröltsch's *Fund-Statistik der vorrömischen Metallzeit im Rheingebiete* (Stuttgart, 1884). Another map shows the sites of old Italian bronze-finds in the same area, and the prehistoric trade routes are marked on a third. All show a connexion between North Italy and the Baltic, which is of interest in connexion with the occurrence of amber at Hallstatt. Whether that material was introduced by trade or migration is a question discussed by Much in *Die Heimat der Indogermanen im Lichte der urgeschichtlichen Forschung* (Berlin, 1902), 139-157, where several references are given. Chemical analysis proves that the amber came from the Baltic coasts.²

An interesting parallel to our bucket was found in one of the Magny-Lambert barrows (tumuli), known as Monceau-Laurent, in the Côte-d'Or, and was published by Alexandre Bertrand in 1889.³ He gave details of four others found in Gaul, and fortunately also details of the objects found in grave no. 299 at Hallstatt, which contained the bucket figured by von Sacken, viz.:

1. A fine bronze sword with gold-foil on the hilt.
2. Gold object of unknown use, with two small rivets.
3. A bronze ring.
4. Four fragments in spiral form.
5. Several pins for the dress.
6. Two grooved bracelets and a bronze finger-ring.
7. A fine bronze bucket with handle and embossed decoration.
8. A bronze cauldron, containing a bronze dish, pottery fragments, and animal bones.

¹ *Archiv für Anthropologie*, xxxi, 281. For Hungary, see *Compte rendu* of Monaco Congress (1906), ii, 64.

² Montelius, *Journ. Anthropol. Inst.*, xxx (N. S. iii), 91; Helbig, *Il Commercio dell' Ambra* (Reale Accad. dei Lincei, 1877); Ridgeway, *Early Age of Greece*, i, 349, 359; *Compte rendu*, Stockholm Congress, 1874, ii, 777-817.

³ *Archéologie celtique et gauloise*, 270 (quoting report of 1873), pl. vii and viii, fig. 7, and p. 304, fig. 82.

The above were deposited on burnt human bones in a clay coffin, which was covered with a cairn. The Monceau-Laurent bucket is 12.6 in. (32 cm.) high and 13.6 in. (34.5 cm.) in diameter: Lord Avebury's specimen is about 12 in. by 13 in., with the same number of cordons and the same rhombs of dots, but lacks its handles, whereas the French specimen has these complete with openwork pendants. The bucket on exhibition still has the ends of both handles attached to the body, and only the curved grip is wanting: hence there can be no doubt that they closely resembled the other examples mentioned.

A similar bucket, with the upper band filled with three rows of dots, was found in a barrow near Tannheim, Leutkirch, Württemberg, in 1906,¹ and is reproduced in *Altertümer uns. heidn. Vorzeit*, v, 325, no. 1025, pl. 56. The body is very imperfect, but two rings remain on a handle, probably for attaching pendants; and the dimensions agree well enough with those already quoted: H. 12.2 in. (31 cm.), diam. 13.8 in. (35 cm.). Other examples of the type there quoted are from Klein-Zöllnig in Silesia (with horse-harness of the third Hallstatt period, 850-700 B.C.); Slupce near Kalisz, on the west border of Poland; Klein-Glein, Styria; and Watsch, Carniola.

Von Sacken's illustration of the Hallstatt bucket is reproduced by Professor Montelius in the *Compte rendu* of the Monaco Congress of 1906 (vol. ii, p. 268), and this argument may be briefly examined here. 'The cists with fixed handles being the only type discovered in the Etruscan tombs of Bologna (Certosa cemetery), which date from the sixth and fifth centuries B.C., the type with movable handles should be earlier than the sixth century. That the latter type really dates from the eighth and seventh centuries is proved by the discoveries at Hallstatt, at Santa Lucia near Trieste, and in other burials of the same period.' With much of this one can readily agree, the bucket with movable handles having been found at Weybridge, Surrey, and attributed to the seventh century B.C. in *Proceedings*, xxi, 469; but there are essential differences between the bucket now exhibited and the Certosa type with fixed handles, and a considerable interval of time seems the only way of accounting for them. The ornamentation of the two broad-ribbed Hallstatt buckets is distinctly archaic. The wheel-design is repeated with waterfowl on two bronzes from Klein-Glein, Styria,² and with the fore part of similar fowl on a bronze urn found in Sweden and a bucket found in Denmark (Professor Montelius's figs. 166 and 171, both about 1000 B.C.). The association is therefore not fortuitous, and has been fully dealt

¹ The original report in *Fund-Berichte aus Schwaben*, xv, 22, is not illustrated. In the barrow were found two bronze dishes and large pottery urns ornamented with graphite, and inside the bucket a bronze jug, a bronze beaker, and pottery dish with graphite.

² *Matériaux*, 1884, p. 310; Much, *Kunsth. Atlas*, xlii, figs. 2, 3; Lindenschmit, *Altertümer*, vol. iii, part vii, pl. 3, fig. 1.

with by Déchelette,¹ who traces the symbols back to the solar boat of the Nile, and shows how the prow and stern came to be represented by swans. The primitive sun-symbol is a circle enclosing a cross, the wheel-pattern being a variant, which is sometimes replaced by concentric rings: the star or cross is a later form, but the wheel came down to Roman times, and is often found in association with the lunar crescent.

Besides the style of decoration there is the evidence of associated objects, and the safest course is to assign the broad-cordoned bucket to the long iron-sword period of Hallstatt. Buckets with narrow cordons are comparatively common, and date apparently from the seventh and sixth centuries B.C. The other type has many peculiar features, though also derived from North-east Italy; and while Déchelette² assigns it to the Arnoaldi stage of Villanova, it has none of the oriental characteristics that then began to appear in Italian metal-work. The second half of the eighth century would suit both these conditions, and would also bring the bucket into the long iron-sword period of Hallstatt (see tables, p. 159).

The recovery and exhibition of the bucket and other antiquities, collected in 1869 when Hallstatt was at the height of its fame, are events of some interest at a time when archaeology and similar activities are in a state of depression. Our only regret is that no detailed account of the particular graves from which these exhibits came can be found among the late Lord Avebury's papers. A copy of Ramsauer's journal obtained by Sir John Evans and himself³, will probably be found by the President in his father's library; but there is less prospect of recovering the catalogue of Lord Avebury's collection.

¹ *Manuel*, vol. ii, pp. 432, 885, and fig. 173 showing degeneration; Montelius, *Journ. Anthropol. Inst.*, xxx (N. S. iii), pl. viii, p. 90.

² *Manuel*, vol. ii, p. 772, fig. 298.

³ Sir John Lubbock, *Prehistoric Times* (2nd ed. 1869), 22. There are other copies at Vienna and at the St. Germain Museum. For a description of the site, with summary of the excavations and finds, see August Aigner's *Hallstatt* (Munich, 1911), p. 139.

VIII.—*The Trousseaux of Princess Philippa, wife of Eric, King of Denmark, Norway, and Sweden.* By W. PALEY BAILDON, Esq., F.S.A.

Read 29th June 1916.

WHEN I last had the honour to bring a Wardrobe Account to your notice, I prefaced my remarks with a short explanation of how the office of the Wardrobe, originally a store-house, gradually became one of the chief purchasing departments of the Royal Household. The principal document to which I shall draw your attention to-night shows the Wardrobe more in its original aspect; the materials and articles referred to were all handed out from store for a specific purpose, and no purchases are recorded. A search through the general accounts immediately before this special one would no doubt result in finding much of the material here dealt with and the price paid for it,¹ but I thought it best to leave those accounts to be dealt with at some future time in their entirety.

Before dealing with the documents in detail some account of the occasion seems desirable.

The Princess Philippa was the youngest daughter of Henry, duke of Lancaster, afterwards by usurpation Henry IV, king of England. His first wife, Mary de Bohun, to whom he was married in 1384, died ten years later, leaving six infant children, of whom Philippa was the youngest, her mother having died in giving her birth.² She was born at Leicester, 4 July 1394. Proposals for her marriage to Eric, king of Denmark, Norway, and Sweden, were made as early as 1400 or soon after; the Danish scheme also included the marriage of Henry, prince of Wales, afterwards Henry V, to Eric's sister, and in 1402 contracts were signed for both these matches. That of the prince of Wales fell through, but Philippa was married by proxy to Eric in West-

¹ Wylie, *History of England under Henry IV* (1894), gives many extracts from contemporary Wardrobe Accounts, including the two accounts here dealt with.

² Most of these details are taken from Wylie, *op. cit.*

minster Abbey on 8 December 1405. On 22 June 1406 an order was issued to charter ten ships and four balingers to take the royal party, and early in August the little fleet sailed from Lynn, landing at Helsingborg. The marriage was again celebrated in the cathedral at Lund, on 26 October 1406, and a formal coronation took place soon after.

Philippa was thus only twelve years of age when she joined her husband. Her mother, Mary de Bohun, was married in 1384, when she was only eleven and Henry was fifteen, but though it had been arranged that she should remain in her mother's care until she was fourteen, she is said to have rather scandalized her relatives by giving birth to a son in the following year. Philippa's elder sister Blanche was born in 1392, and married to Louis, duke of Bavaria, son of the Emperor Rupert, in 1402. Philippa died without issue on 6 January 1430, and was buried in the Brigittine House at Wadsterna, on the shores of Lake Wetter. It is said to be owing to this fact and the interest thereby taken in the order that Henry V founded the Brigittine House of Syon in memory of his father and mother.

The principal account with which I am dealing is mainly taken up with a list of materials handed out to John Dun, valet-tailor to the queen of Denmark, for the purpose of making and trimming various garments. There are several subdivisions to which I shall refer in due course.

THE QUEEN'S GARMENTS.

The dresses occur under the several descriptions of gowns, robes, tunics, and supertunics.

The first item is the wedding dress; it is described as a tunic and mantle with a long train of white satin worked with velvet, furred with pured minever and purflled with ermine, and the sleeves of the tunic also furred with ermine. I am uncertain whether the 'satin worked with velvet' means what is nowadays called a velvet brocade, or velvet sewn in a pattern on to satin. In either case the dress appears to have been worthy of the occasion.

The gowns numbered five. No. 1 was of cloth of gold of Cyprus worked with white flowers and furred with pured minever.

No. 2 was of red velvet, embroidered with pearls, furred with pured minever and purflled with ermine. This is probably the gown referred to later on in the account. Peter Swan, 'the broderer', embroidered the sleeves and collar of a gown of red velvet with pearls, gold of Cyprus, and silk, in the manner of a ribbon about the sleeves and collar. The embroidery was worked on sindon, a kind of thin silk, and linen; $4\frac{1}{2}$ lb. of gold of Cyprus and 3 oz. of solid gold [*aurum soldatum*] were used, 1,368 pearls, and 20 oz. of pearls, the last probably small seed pearls delivered out by weight and not counted.

No. 3 was of red cloth of gold of Cyprus, worked with white roses, furred with pured minever and purfled with ermine.

No. 4 was a long gown of cloth of gold of Cyprus, having a white ground worked with blue flowers, furred with pured minever and purfled with ermine.

No. 5 was of green cloth, lined with green tartarin, perhaps a travelling dress.

Another garment is described as a robe of blue velvet, comprising a tunic, an open supertunic, and a mantle with a train, furred with pured minever and purfled with ermine.

There were four tunics and gowns, one of green cloth and one of scarlet, each furred with pured minever and purfled with ermine; the third was of black cloth, the tunic furred with pured minever and the gown with grey minever; the fourth was of green cloth, lined with green tartarin. There was also a tunic of green cloth, apparently not furred.

Another combined garment is described as a gown and a mantle with a 'trayil' or train of blue and green cloth of gold of Cyprus worked with eagles of gold, and furred with pured minever.

A mantle of blue cloth, furred with pured minever, was provided *in aram pro pluvina*.

A pair of sleeves and a mantle were made of cloth of gold 'attaby', worked with 'swyrells' of gold, the sleeves furred with pure minever and the mantle with ermine. The only definition I can find of 'attaby' is *panni species*, which is not very helpful.¹

A certain amount of stock was provided and delivered to the queen's chamber for use when required, apparently by her own ladies and tire-women. It consisted of a thousand pearls, 16½ oz. of silver-gilt spangs, five silk chaplets, three tissues of silk, sixteen ells of cloth of 'Reyns', 18¾ ells of cloth of 'Cham-paign', and 5¼ ells of linen cloth of Brabant.

From one of the miscellaneous documents we learn that the thousand pearls were delivered to 'Madame de Watterton, Maistresse de Roigne de Danmark', for embroidering the collar and sleeves of a gown.

Head-gear. The head-gear consisted solely of a cap and two hoods. The cap was of beaver furred with ermine, and was garnished with a silk button and tassel. One of the hoods was of scarlet cloth, and the other of black cloth; both were furred with pured minever.

Foot-gear. Three pairs of boots are described in detail. One pair was of shaved leather [*de coreo rasez*], which perhaps means smoothed or polished,

¹ See Ducange, s. v. Attabi.

furred with backs of greys. The other two pairs were of black leather, one furred with pured minever and the other with backs of greys.

Four pairs of 'punceons' were made of white leather, two pairs furred with pured minever and two with backs of greys.

Thirteen pairs of shoes [*sotulares*], four pairs of boots [*boteux*], and four pairs of 'punceons', not described in detail, are included among the miscellaneous items.

'Punceons' or 'pinsons' were thin shoes of some kind, possibly slippers or pumps; no contemporary description of them is known.

Beds. The hangings, &c., of the bridal bed were of a very gorgeous character. They were made of cloth of gold of Cyprus with a red and black ground, worked with thistle-flowers [*cum floribus carduum*]. They consisted of a coverlet [*coopertorium*]; a tester with an entire 'celure', lined with blue buckram, bound with thread ribbon and garnished with silk fringe; six cushions of the same cloth, lined with white fustian and buckram, bound with ribbon and having silk buttons; three curtains of red tartarin, bound with silk ribbon, and furnished with copper rings; two fustians; one canvas of blue card; eight costers and five 'tapets' of worsted for hanging and stretching the bed, and a sack of cloth to contain the bed (which apparently includes all the above articles) for carrying purposes.

It will be noticed that only three curtains are here mentioned. The hanging for the head of the bed appears in another part of the account. It is described as a 'coverchief' of cloth of gold of Cyprus, worked with gold falcons and swans, and furred with pured minever *pro capite lecti*.

A coverlet [*coopertorium*] of blue long-cloth furred with pured minever, for covering the queen's bed, and another of red long-cloth are also mentioned. In addition there were two winter mantles of cloth of frieze, one furred with pured minever and the other with backs of greys, for covering the queen's bed.

Two mattresses of card, bought from Thomas Netton, for the queen's bed, were covered with tartarin on one side and buckram on the other.

Only three pairs of sheets were provided, two of cloth of Reynolds and one of cloth of Champagne. The size is recorded in each case. They were five ells long and four ells wide. The later English ell measured 45 in., but at this period the ell and the yard seem to have been identical. A sheet 15 ft. by 12 ft. suggests a bed approaching in size to the celebrated one of Ware. Even if we take the measurement by the Flemish ell of 25 in. we have a sheet 10 ft. 5 in. by 8 ft. 4 in., which seems unnecessarily large.

Four sheets for the head of the bed, made of cloth of Reynolds, were 3½ ells long and three ells wide. Their use is not clear.

An extra set of three curtains of red tartarin was provided for the bed.

There was another bed of blue and white silk, perhaps for use on ship-board, for which six cushions newly covered with blue satin and a pair of white fustians were provided.

A 'cloth of estate' [*pannus destat*], made of cloth of gold of Cyprus lined with buckram, and having a silk fringe, was provided to hang above the queen's head when sitting at table.

A third bed, not mentioned in the main account, is described in one of a bundle of miscellaneous documents. It was made of white satin, embroidered with the arms of our lord the king, and consisted of a 'covertour', a tester with an entire 'ciel', three curtains of white tartarin, also embroidered with the royal arms, six cushions, six white 'tapites' embroidered *en tapicerie*, with M's crowned, a piece of arras worked with gold which begins *Pur signesion demonstrer*, another piece of arras worked with gold which begins *Che listore es de grant renon*, and a third piece of arras which begins *Vees chevauchier cel vassal*.

These descriptions seem to refer to the legends worked on the tapestry: I have not been able to identify them.

MISCELLANEOUS.

A carriage of some sort, called *currus et wherl*, was provided. It was garnished in divers parts, both within and without, *per baill* [?], and elsewhere as was necessary, namely, two covers of scarlet cloth and two of red cloth, lined with 'Westvall' and waxed canvas to preserve them from rain, and two covers of cloth of gold of Cyprus lined with buckram, garnished with silk ribbon and fringe. The carriage was garnished within with cloth of gold, nails of copper gilt, red leather, gold ribbon of Venice, and silk laces [*laq' ? laquei*] pounced [*punct' de roo*], and stuffed with wool.

Six cushions—two long and four short—belonged to the carriage. They were made of leather, covered with cloth of gold of Cyprus, lined with blue buckram, bound with silk ribbon, and furnished with buttons and tassels of silk.

Eight saddles [*sellae*] with gilt harness and eight bits were handed to officers appointed by the king of Denmark.

The expression *currus et wherl* apparently refers to one article only. *Currus*, in documents of this period and earlier, is generally applied to a large wagon used for the conveyance of goods; a 'whirle' or 'whirlicote' was a light carriage with four wheels for persons. Stow, referring to the introduction of side-saddles, says, 'and so was the riding in those whirlicotes and chariots forsaken, except at coronations and such-like spectacles'.¹

¹ See J. H. Markland, F.R.S. and S.A., 'On the early use of carriages in England,' *Archaeologia* xx, 443.

We learn from another source that in 1402-3 a chariot for the Lady Philippa, the king's daughter, was painted at a cost of £5, while £10 was paid to a goldsmith for providing certain 'pommels' for it.¹ This is probably the same vehicle. The mention of eight saddles and eight bits suggests that it was intended to be drawn by eight horses, each with its postillion.

Silver. No plate is mentioned in the main account, but a list is given in two of the miscellaneous documents. The first of these is a warrant to Walter Loveney, the queen's treasurer, to deliver to the queen, or to such persons as she should appoint, certain articles lately delivered to him by Thomas Nevill, Lord de Fournivall, treasurer of England, dated 8 August, 7 Hen. IV, 1406. The second is a receipt, dated 2 November, 8 Hen. IV, 1406, for the same articles handed by Loveney to John Dwe, knight, master of the court of the queen of Denmark, Sweden and Norway, Audbern, provost of Bergen (Norway), Andrew, provost of Upsal, and Peter Lukke (or Lykke), archdeacon of Roeskilde (Denmark). I quote from the latter document because the list of articles is classified according to their use; the weights are given in the former list only.

For the chapel.—A pair of candlesticks and a pax-bread of silver-gilt, and a pair of cruets and a bell of silver.

For the 'panetre'.—Two covered salts [*salers*] of silver-gilt; two others parcel-gilt; two spoons [*quillers*] of silver-gilt and twelve of plain silver.

For the 'butillerie'.—Two pots of silver-gilt and two of plain silver; one hanap of plain gold; one high hanap of gold pounced; one hanap of beryl garnished with gold; and an ewer of the same suite.

One covered hanap of silver-gilt and worked with the arms of England with a border; one covered hanap of silver-gilt pounced with an eagle; sixteen silver hanaps. The larger of the silver-gilt pots weighed 8 lb. 5 oz. Troy weight.

For the 'squillerie'.—Forty-eight silver dishes [*esquilles*], which weighed over 66 lb.; four chargers, weighing 12 lb. 2½ oz.; twenty-four 'saucerr's'.

For the 'spicerie' and 'chaunder'.—A spice-plate of silver-gilt, weighing 3 lb. 7 oz.; two others parcel-gilt, weighing 4 lb. 5 oz.; two candlesticks of silver-gilt and two parcel-gilt.

For the 'eawarie'.—A pair of covered basins of silver-gilt and chased, weighing 10 lb. 8 oz.; another pair parcel-gilt; another pair of silver; another pair of silver with ewers; and another pair described as round.

For the 'aumerie'.—An 'almondsdissh' of silver in the guise of a ship [*nief*].

The fondness of our ancestors for making things in the form of ships is still shown by our use of the word 'boat' for small vessels of various kinds, e.g.

¹ Devon, *Issues of the Exchequer*, p. 296.

sauce-boat, pap-boat, and alms-dishes in that form are recorded. A Wardrobe Account of 1401 mentions a large ship [*navis*] called an almsdish, with a leopard standing on the stern; and another, probably the one in question, is described as a silver nief called an almsdish, worked with seven leopards for Philippa.¹

Chapel. For the queen's chapel there were provided a 'front', a 'contre-front', a pair of 'ridels', a 'parure',² a cope, two albs, two amices, two fanons, two stoles, a chasuble, two tunics, a towel, a cloth for the lectern, a corporas in a case, a superaltar, and a 'pewe'. The latter was probably a chair or prie-Dieu. There was also a 'travasyn' of blue and white tartarin for the queen's chapel.

The silver for the chapel has already been mentioned.

Some articles of uncertain use are described as two dorsers, with two 'celures' and curtains, of blue card, furnished with copper rings, *pro pilis, robis et lectis domine Regine*. These articles suggest an arrangement of hangings in the nature of a portable or temporary wardrobe.

Two 'traversyns' of blue and white tartarin, furnished with copper rings, for the queen's great chamber, and another for the middle chamber.

Traverses were partitions or screens consisting of curtains that could be drawn across to subdivide a chamber.

An oblation was made at Lynden in Denmark [*in Dacia*, Lund in Sweden], on the days of the marriage and coronation, consisting of two cloths of gold of Cyprus and two cloths of gold 'racamatus'. This expression is said by Ducange [*s.v. Racamas*] to be derived from a Hebrew word *racam*, *quod est acu pingere*, and he defines it as ornamented with Phrygian work [*opere phrygio*], gold or other material, and says it was one of the more precious kinds of cloth formerly known.

Among the other miscellaneous articles of the outfit were four standard coffers bound with iron, two pairs of trussing coffers, eight sacks for cloth, two portmanteaux [*mantica*] of leather, one dag [?] of leather, 300 small hooks [*crochettes*] of iron, 200 iron 'hokes', one iron hammer, one 'colshovell' of iron, one iron pan [*patella*], one folding iron chair, one latten basin, a copper 'chaufour'.

The folding iron chair is probably the *privata cathedra*, mentioned in another part of the account as being covered with red cloth, a thoughtful provision; the iron pan and the coal-shovel were no doubt used in connexion with it. Coal is, of course, charcoal. The copper chauffer was, I imagine, one of those charcoal brasiers still commonly used in country places abroad as foot-stoves: I believe the French call them 'chauffoir' or 'chaufferette'.

¹ Wylie, *op. cit.*, iv, 198, 208.

² Generally ornaments for albs, &c.; here apparently some indeterminate ornamental hanging.

Ship. John Elmeton, clerk of the king's ships, was paid £10 for mending and fitting up a ship called *le Holygost*, of which John Maihewe was master, which had been appointed to take the queen to the parts of Denmark and Sweden.

One 'dragg' of white fustian on both sides, stuffed with wool, for the queen's ship, required forty-eight ells of fustian and six stone of wool. I cannot suggest what this was.

Six 'pailletts' of canvas, each containing twelve ells, were made for the bed on the ship.

Two cabins were constructed on the ship, one above *le hachez*, and one below; they were made of waxed canvas and lined inside with red worsted. There was a hanging of cloth of gold of Cyprus in one or both of them. Another cabin of worsted was provided for the queen's ladies.

John Drayton, the 'pavilloner', made a pavilion for the queen's ship, called *le Seint Espirit*.

Retinue and liveries. Henry Bowet, bishop of Bath and Wells, had been appointed to escort Philippa abroad. He received for his livery fourteen ells of scarlet cloth, fourteen ells of green cloth, and seventeen timbers¹ of pured minever.

Sir Walter Hungerford, the queen's chamberlain, had sufficient scarlet cloth for a long gown and thirty timbers of pured minever for trimming it.

The queen's two principal ladies-in-waiting, Lady de Bromwyche and Lady de Lyle, each received fourteen ells of scarlet cloth and six ells of green cloth for their livery, and fifteen timbers bellies of pured minever.

The eight damsels [*domicellae*] each had seven ells of scarlet cloth, five ells of green cloth, and three timbers bellies of pured minever.

The nine knights in attendance each received five ells of scarlet cloth and five ells of green cloth, to make two gowns with hoods, but no fur.

William Loveney, the clerk, and Richard Clifford, the keeper of the wardrobe, each had five ells of scarlet cloth and four ells of green cloth.

Thirty attendants of lesser rank, including serjeants-at-arms, one of the masters of the ships, and a scutifer (which I think here must mean literally a shield-bearer, and not an esquire), each had five ells of scarlet cloth and four ells of green cloth for making a gown with a hood.

Eight clerks of divers offices of the household each had four ells of scarlet cloth and four ells of green cloth to make a gown with a hood. Eight minstrels, including Richard Trumpour and John Harpour, had the same allowance.

The next group of servants are described as *valetti* of the chamber and

¹ A definite quantity of furs; a package containing forty skins. *N.E.D.*

offices; one would call them 'grooms of the chamber' but for the fact that a later group are called *garciones*. There were forty-one of these *valetti*, each of whom received four ells of red cloth and $3\frac{1}{2}$ ells of green cloth for a gown and hood.

Three *valetti curie* had the same allowance.

Thirty-five grooms [*garciones*] of the chamber and office each had four ells of red cloth and $2\frac{1}{2}$ ells of green cloth for a gown and hood.

A livery of green cloth only to twelve persons, two of whom are described as chamberlains of the exchequer, is crossed out because they did not go abroad with the queen.

Fifteen pages [*pagetti*] of the chamber and offices of the household each had four ells of red cloth and three ells of green cloth for a gown and hood.

Each livery of green cloth, of lords, knights, esquires [*scutiferi*], *valetti*, grooms [*garciones*], and pages, was worked with a crown [*corona*] of white cloth, worked in divers manners for divers degrees [*pro diversis statibus*], according to the ordinance of the king's council, in embroidery and cut work, with the motto [*dictamen*] 'Sovereigne', and sewn upon the garments of the said lords, &c.

Danish attendants. A Danish knight, coming as ambassador, had two cloths of gold of Cyprus as his livery.

Other Danish officials and retinue were fitted out in the regulation scarlet and green.

William, bishop of Denmark [*de terra Dacie*], one of the four ambassadors from the king, received five ells of scarlet cloth, five ells of green cloth, seventeen timbers bellies of pured minever, and twenty-nine beasts of ermine.

The three other ambassadors had the like livery of cloth, but no fur.

Master Peter Luk, archdeacon of Roeskilde, and Andrew Olavsen [*filius Olavi*], a Danish knight, each had five ells of scarlet cloth and four ells of green cloth.

Twenty Danish esquires [*scutiferi*], coming with the ambassadors, had the like allowance.

Five clerks, coming with the ambassadors, had five ells of scarlet and five ells of green.

Ten *valetti*, coming with the ambassadors, had four ells of red cloth and four ells of green.

Brother John, of the Order of Minors, the queen's confessor, received seven ells of russet cloth. He must have afforded a pleasant relief to the eye after all these scarlet and green popinjays.

Including the ten ladies and the forty-one Danish officers and their party, we get a total of 204 people all flaunting in green and scarlet. If we add to these the personal servants of the retinue, of whom there must have been a good

number, and the luggage of the whole party, we can appreciate the necessity for the ten ships and four balingers.

Wages, &c. A bundle of miscellaneous documents directly relating to the marriage is preserved among the Wardrobe Accounts; they consist mostly of warrants to William Loveney, the treasurer specially appointed for the occasion, and receipts for moneys paid by him.

Richard of York, brother to the duke of York, and Henry Bowet, bishop of Bath and Wells, who were assigned to accompany the queen to Denmark, each received five marks a day for a quarter of a year, which amounts to £303 6s. 8d. This seems a liberal allowance, which, calculating the purchasing value of money at that time as twelve times the present value (probably an under-estimate), would amount to over £3,000. Out of this they would have to provide for their own personal retinue and equipment.

Henry, Lord Scrope of Masham, received £162; Sir Piers de Bukton, steward of the household to the queen, and Sir John his son, received £100; Sir Walter Hungerford, sheriff of Wiltshire, chamberlain, received 100 marks, and Richard Clifford, clerk, the 'wardrober', £33 6s. 8d.

Thomas Molyngton, baron of Wemme, received £20 for his wages and reward.

John Peraunt, sergeant-at-arms, received £5.

Katherine, wife of Sir Hugh de Waterton, 'mestress a nostre dite fille', and Dame Anne Lisle were each paid £60 in London before starting and £40 at Lynn in full payment for their wages and reward. Lady Lisle apparently remained behind in Denmark, for there is a warrant dated January 25 in the ninth year, 1407-8, to pay her £26 for the expenses of herself and her servants coming from Bamborough to London after their arrival in England coming from the parts of Denmark.

Arms. The royal arms are twice mentioned. The hangings of what, in this tercentenary year of the national bard, we may perhaps describe as 'the second-best bed' were embroidered with the arms of our lord the king; and a covered cup of silver-gilt was worked with the arms of England with a border. Some valuable notes on the use of the border as a differencing to the royal arms will be found in Mr. Griffin's exhaustive paper on the heraldry of the cloisters at Canterbury,¹ from which it appears that Humfrey, duke of Gloucester, the fourth son of Henry IV and brother to the queen of Denmark, used a border argent to difference his arms. No instance is given of this use by any of Henry's other children, and the queen of Denmark's arms at Canterbury do not show a border [no. 768]. The king of Denmark's arms appear five times—four shields with the single arms of his four principalities, viz. Denmark, Norway, Sweden, and

¹ *Archaeologia*, lxvi, 447.

Livonia, the last being doubtful, and a fifth time with these four shields quarterly, impaling France and England quarterly.

In conclusion, I should like to say a word about the livery colours and badges or ornaments mentioned. We are badly in want of an authoritative treatise on these subjects; there are scraps and snippets in most heraldry books, but there is room for a special work and ample material. We have at present several Fellows who could do it, preferably in conjunction, and I trust this hint may bear fruit.

The blue flowers embroidered on one of the gowns were probably forget-me-nots. Wylie quotes a number of instances where Henry IV used this badge (iv, 117, 163, 164, 169), and on one occasion in 1395 there is mentioned a gold collar *ad modum de floribus de Sovenie ve de moy*. It is quite possible, as Wylie suggests, that this was the origin of the collar of SS.: the word *Sovereigne* may have been a later interpretation after he acquired the throne; it was used on the liveries of Philippa's retinue.

White flowers and white roses were also used on gowns, while thistle flowers were used for one of the beds, but only on the hangings, fortunately for the occupants.

Of a more definitely heraldic character are the falcons and swans which adorned another bed, the eagles on a gown and a hanap, and the squirrels on a pair of sleeves and a mantle.

Now I cannot help thinking that most, if not all, of these devices were used with a definite significance, and not merely as ornament. The precise significance may be lost to us, but I believe it was there, nevertheless, to the person for whom it was designed and made. The reckless scattering of various objects by way of so-called ornament belongs, I conceive, to a later age; in the fifteenth century there was no need to do this, since there was a wealth of badges, emblems, and symbols to choose from.

Exchequer Q. R. Accounts. ⁴⁰⁶/₁₀.

. No heading ; ? some membranes missing.

Johanni Dun, valletto scissori domine Regine, ad unam tunicam, unum mantellum cum trayn' long' de satyn albo operato cum velvett fac' et furrur' cum minever pur' et purfil' cum ermyn, et manicas dicte tunice fur' cum ermyn, pro die solempnizacionis matrimonii inter Regem Dacie facta et consuta (?) in Garderoba, erga transitum suum versus partes Dacie.

iiij pecias satyn' operatas cum velvett. tunicam continentem x } minever
tymbres xxxij ventres. } pur'.
mantellum de xxvij tym-
bres xxiiij ventres. }
purfil' eorundem garn' ij tymbres,
vij best' ermyn.

Eidem ad unum gownum de panno адауро de Cipro operatum cum floribus albis factis furrur' cum miniver pur', pro Regina erga transitum suum versus partes predictas.

ij pannos адауро de Cipro.
xxxij tymbres xxij ventres miniver
pur'.

Eidem ad unum gownum de velvett rubro faciendum et operandum inbroud' cum perlis, cum minever pur' purfil' cum ermyn, pro Regina erga transitum predictum.

ij pecias j ulnam velvett rubri.
xxxvj tymbres xxij ventres minever
pur'.

Eidem ad unum gownum de panno адауро de Cipro rubro operatum cum rosis albis faciendum, et furrur' cum minever pur', et purfil' cum ermyn, pro Regina erga transitum predictum.

ij pannos адауро de Cipro.
xxxij tymbres viij ventres minever
pur'.

Eidem ad unum gownum longum de panno адауро de Cipro campo albo operato cum floribus blodis faciendum, et furrur' cum minever pur' et purfil' cum ermyn, pro Regina [?] erga viagium predictum.

ij pannos адауро de Cipro.
xxxij tymbres xxvj ventres minever
pur'.

Eidem ad unam robam de velvett blu continentem unam tunicam, unam supertunicam apertam et unum mantellum cum trayn faciend' et furrur' cum minever pur' et purfil' cum ermyn, pro Regina erga transitum predictum.

vj pecias ij ulnas velvett blu ; tunica
de xij tymbres ; supertunica de xij
tymbres di. ; mantellum de xxvij
tymbres xxvij ventres minever pur'.
purfil' eorundem garn' xij best'
ermyn.

fo. 1 d.

Eidem ad unam tunicam de panno viridi faciendam et consuendam et garnisandam infra Garderobam suam, pro Regina erga transitum predictum.

ij ulnas di. panni viridis longi.

Eidem ad unam tunicam, unum gownum de panno viridi facienda et furrur' cum minever pur' et purfil' cum ermyn, pro Regina erga transitum predictum.

vij ulnas di. panni viridis longi.
tunica de xij tymbres xv ventres,
gounum de xxxij tymbres xv ven-
tres minever pur'.

Eidem ad unam tunicam et unum gownum de panno scarlett facienda et furrur' cum minever pur' et purfil' cum ermyn, pro Regina erga transitum predictum. } viij ulnas panni scarlett.
tunica de xij tymbres di., gownum de xxxvj tymbres xxij ventres minever pur'.

Eidem ad unam tunicam, unum gownum, de panno nigro longo facienda et furrur', vidz. tunica furrur' cum minever pur' et gownum furrur' cum minever gr[is?], pro Regina erga dictum viagium. } vij ulnas di. panni nigri longi.
tunica de xij tymbres di. ventre minever pur'.
gownum de xxxiij tymbres xxij ventres minever gris[?].

Eidem ad unum gownum de panno viridi longo faciendum et liniandum cum tartarin viridi, pro Regina erga transitum predictum. } v ulnas panni viridis longi.
j peciam tartarin viridis.

Eidem ad unam tunicam, unum gownum de panno viridi facienda et linianda cum tartarin viridi, pro Regina erga transitum predictum. } vij ulnas di. panni viridis longi.
j pecium di. tartarin viridis.

Eidem ad unum par manicarum et unum mantellum de panno адаuro attaby operata cum Swyrell de auro factis et furrur', vidz. manice furr' cum minever pur' et mantellum cum ermyn, pro Regina erga dictum viagium. } ij pannos адаuro attaby.
manicam de v tymbres ventribus minever pur'.
mantellum de xix tymbres ermyn.

Eidem ad furrur' ij capuciorum, vidz. unum capucium de panno scarlett et j de panno nigro longo faciendum et furr' cum minever pur', pro Regina erga transitum predictum. } di. ulnam panni scarlett.
di. ulnam panni nigri longi.
v tymbres di. ventris minever pur'.

fo. 2.

Eidem ad unum coopertorium de panno blu longo faciendum et furr' cum minever pur' ordinatum et factum pro lecto domine Regine cooperiundo, erga viagium predictum. } x ulnas panni blu longi.
lvj tymbres xxviiij ventres minever pur'.

Eidem ad unum mantellum de panno blu longo faciendum et furr' cum minever pur', pro Regina habendum in aram[?] pro pluvia. } v ulnas panni blue longi.
xxvj tymbres minever pur'.

Eidem ad unum coopertorium de panno rubro longo faciendum et furrur' cum minever pur' ordinatum et factum ad cooperiendum lectum domine Regine. } x ulnas panni rubri longi.
lvj tymbres xxviiij ventres minever pur'.

Eidem ad ij mantella hiberna facienda de panno frisas unde j furrur' cum minever pur' et alter furr' cum tergis de grys, ordinatum ad cooperiendum lectum domine Regine erga transitum predictum versus partes predictas. } ij mantella hiberna.
xxxv tymbres di. ventris minever pur'.
xxv tymbres x terga grys.

Eidem ad furrur' unius cappe de bevir furr' cum ermyn et garnit' boton et tassell de serico, pro Regina erga transitum predictum, } j cappam de bevir.
l bestes ermyn.

Eidem ad furrur' iij par de boteux unde j par de coreo
 rasez furrur' cum terges de grys, et ij par de coreo nigro
 unde j furrur' cum minever pur' et alter cum terges de
 grys, pro Regina erga transitum predictum.

} xlvij ventres minever pur'.
 } ij tymbres xxx terges grys.

Eidem ad furrur' iiij par punceon de coreo albo, unde ij
 par furrur' cum terges de grys et ij par furrur' cum minever
 pur', pro Regina.

} ij tymbres ventres minever pur'.
 } ij tymbres terges de grys.

Venerabili patri Henrico Batoniensi et Wellensi Episcopo,
 ad vesturam suam et apparatus tam de panno viridi
 quam scarletto facienda.

} xiiij ulnas panni scarletti.
 } xiiij ulnas panni viridis longi.
 } xvij tymbres ventres minever pur'.

fo. 2 d.

Uni militi de terra Dacie venienti in ambaciatam pro
 maritaggio inter Regem Dacie et Philippam filiam Regis
 Anglie, de dono domine Regine.

} ij pannos adauratos de Cypro.

Waltero Hungurford, militi, camerario domine Regine, ad
 unum gownum longum de panno scarletto faciendum et
 furrur' cum minever pur', de dono domine Regine, erga
 dictum viagium.

} xxx tymbres minever pur'.

Eidem pro j coverchief de panno adaureo de Cipro
 operatum cum falconibus et signis [*sic*] de auro factis et
 furrur' cum minever pur', pro capite lecti domine Regine
 erga dictum viagium.

} ij pannos adaureos de Cipro.
 } xxxij tymbres minever pur'.

Eidem ad cooperiendam privatam cathedram domine
 Regine de panno rubeo curto factam erga viagium pre-
 dictum.

} iij ulnas panni rubei curti.

Domine de Bromwyche et domine de Lyle ad vesturas
 suas de cons[imili?] dono domine Regine factas et furrur',
 videlicet, utrique earum xiiij ulnas panni scarlett, vj ulnas
 panni viridis longi, et ij furr' utraque de xv tymbres
 ventris minever pur', erga viagium predictum.

} j pannum scarlett.
 } xij ulnas panni viridis longi.
 } xxx tymbres ventres minever pur'.

Isabelle Fymber, Margerie Savage, Marie Scales, Katerine
 Punchardon, Elizabethe Cavendissh, Margerie Elys,
 Elizabethe Bolthorpp, Alicie Gowe, domicellis domine
 Regine, pro vesturis et apparatus earum, videlicet,
 cuilibet illarum vij ulnas panni scarlett, v ulnas panni
 viridis longi et ij tymbres ventres minever pur', de dono
 dicte domine Regine erga transitum predictum versus
 partes predictas.

} ij pannos scarlett.
 } j pannum xij ulnas panni viridis longi.
 } xxiiij tymbres ventres minever pur'.

Domino Ricardo de York, domino Henrico Scropp, domino Petro Bukton, domino Waltero Hungerford, domino Johanni Monyngton, domino Johanni Bukton, domino Georgio, domino Elans' [?], domino Johanni de Devill, militibus domine Regine, videlicet, cuilibet illorum v ulnas panni scarlett et v ulnas panni viridis longi, ad ij gouna cum capuciis facienda, de dono domine Regine, pro liberacionibus suis erga transitum suum versus partes predictas.

j pannum xvij ulnas panni scarlett.
j pannum xvij ulnas panni viridis longi.

fo. 3.

Willelmo Coveney, clerico, et Ricardo Clifford, clerico, Custodi Garderobe domine Regine, videlicet, utrique eorum v ulnas panni scarlett et iiij ulnas panni viridis, pro liberacionibus suis de cons[imili?] dono domine Regine erga transitum predictum versus partes predictas.

x ulnas panni scarlett.
viiij ulnas panni viridis longi.

Radulpho Ramesey, Roberto Wynkefeld, Thome Charles, Thome Ramesey, Roberto Teye, Henrico Godard, Johanni Chedunden, Johanni Parant [?], servienti ad arma, Gilberto de la Verge, Henrico Egmanton, Henrico Roignon, Peter Denmark, Elizeo Mascall, Philippo Ussher, Johanni Basset, Johanni Puncherdon, Thome Denton, Henrico Busshum, Henrico Wafrer, Roberto Bolthorp, Edgaro Stout, Johanni Gold, Johanni Mayhew, Thome Buk, Johanni Twayt, Johanni Hull, Everardo Husman, uni Magistrorum navium, — Derby, — Peleyn, — Libert[?] Heroud[?], scutiferis domine Regine, ad gounum cum capucio de cons[imili?] liberatione dicte domine faciendum, videlicet, cuilibet illorum iiij ulnas panni viridis longi et v ulnas panni scarlett, erga transitum predictum.

v pannos x ulnas panni scarlett.
iiij pannos viij ulnas panni viridis longi.

Domino Willelmo —, clerico speciarii, Ricardo Ragge, Hugoni Leverseg, Petro Stanlow, Thome Lillebourne, Edmundo Cleobury [?], Johanni Lechefeld, et Hugoni Netelham, clericis diversorum officiorum de hospicio domine Regine, ad gounum cum capucio faciendum de cons[imili?] liberatione, videlicet, cuilibet eorum iiij ulnas panni scarlett et iiij ulnas panni viridis longi, erga transitum predictum.

j pannum iiij ulnas panni scarlett.
j pannum iiij ulnas panni viridis longi.

Willelmo Byngeley, Waltero Lynne, Willelmo Algode, Johanni Trumpyngton, Waltero Aleyn, Ricardo Trumpour, Johanni Beauchamp, et Johanni Harpour, Ministrallis domine Regine, ad gounum cum capucio faciendum, videlicet, cuilibet eorum iiij ulnas panni scarlett et iiij ulnas panni viridis, de cons[imili?] liberatione dicte domine Regine erga transitum predictum.

j pannum iiij ulnas panni scarlett.
j pannum iiij ulnas panni viridis longi.

Prefato Johanni Dun [?] ad unum gownum et unum mantellum cum trayil de panno adaureo de Cipro P
 blu et viridi operata cum aquilonibus de auro factis, et furrur' cum minever pur', pro Regina erga dictum viagium.

v pannos adaureos de Cipro bale [?]
 gownum de xxvij tymbres mantellum
 de xxxiij tymbres ventres minever
 pur'.

fo. 3 d.

Johanni Wodde, ussher, Johanni Lambe, Goselino Lodes, Johanni Duk, Johanni Mapilthorp, Johanni Hobnore, Henrico Nordreys, Johanni Dun, Johanni Bonworth, Jacobo Vall, Johanni Danyaiesseg [?], Johanni Lavender, Johanni Brewster, Thome William, Philippo Gilder, Johanni Waltham, Johanni Warton, Ricardo Botiller, Thome Hervy, Viviano Massy, Rogero Nedwode, Johanni Birkyn, Nicholao Stafford, Johanni Bertelot, Johanni London, Willelmo Walsingham, Willelmo Clerk, Johanni Bonefant, Henrico Kirkeby, Johanni Porter, Willelmo Camp [?], Johanni Morne, Johanni Panetre, Johanni Werkworth, Philippo Forest, Johanni Mapulton, Willelmo Hethe, Janico Shipman, Johanni Sewall, Ricardo Gervays, Claus van Spire, valettis camere et officii domine Regine, ad gownum cum capucio faciendum, videlicet, cuilibet eorum iiij ulnas panni rubri longi et iiij ulnas di. panni viridis longi, de cons[imili?] liberatione, erga dictum viagium versus partes predictas.

v pannos xxiiij ulnas panni rubri longi.
 v pannos iiij ulnas di. panni viridis longi.

Johanni Vanion [?], Waltero Emery, et Johanni Lailbury [?], valettis curie domine Regine, ad gownum cum capucio de cons[imili?] liberatione faciendum, videlicet, cuilibet eorum iiij ulnas panni rubri longi iiij ulnas di. panni viridis longi, erga transitum suum versus partes predictas.

xij ulnas panni rubri longi.
 x ulnas di. panni viridis longi.

Thome Ton [?], Symoni Park, Thome Midelham, Ricardo Ouston, Ricardo Stanes [?], Johanni Willes [?], Johanni Walter, Stephano Aileward, Henrico Massy, Willelmo Leg, Thome Wyot, Rogero Howell, Henrico Stokes, Johanni Godbier, Johanni Hall, Johanni More, Thome Kyng, Nicholao Frend, Johanni Walssh, Roberto Brewhous, Ricardo de Rob' [?], Johanni Taillour, Johanni Wyngate, Thome Pole, Johanni Wol' juniore, Thome Parker, Johanni Neel, Johanni Taillour Chapeis [?], Johanni Barbour, Johanni Burton, Johanni Lyllyng, Johanni Waryn, Johanni Holt, Johanni Lusdon, Willelmo Northampton, garcionibus camere et officiorum dicte Regine, ad gownum cum capucio faciendum de cons[imili?] liberatione, videlicet, cuilibet eorum iiij ulnas panni rubri curti et ij ulnas di. panni viridis curti, erga predictum viagium.

vj pannos ij ulnas panni rubri curti.
 v pannos vij ulnas di. panni viridis curti.

Johanni Oudeby, Johanni Leggeburn, camerariis Scaccarii,
 Johanni Darell, Willemo Darell, Johanni Burgh, Johanni
 Skelton, Americo Newerk, Johanni Wachet, Galfrido
 Colet, Rogero Haldenby, Galfrido Louthet, et Roberto
 Hunney [?], cuilibet eorum iiij ulnas panni viridis longi ad
 gownum cum capucio de cons[imili ?] dono domine Regine
 erga viagium predictum. } j pannum xx ulnas panni coloris
 longi.

[This item is crossed out, and the following note added:—‘Disallocatur quia sine warranto
 et non profecti fuerunt cum prefata Regina ad partes extras.’]

fo. 4.

Hugoni Smyth, Johanni Beverage, Johanni Assh, Ricardo
 Wykham, Nicholao Treygold, Henrico Mist, Willemo
 Crosse, Roberto Wythenore, Johanni Blakewell, Johanni
 Castell, Willemo Spaldyng, Roberto Tomesson, Willemo
 Chestreshire, Ricardo Braynford, et Arnaldo Skowrer,
 pagettis camere et officiorum hospicii domine Regine,
 ad gownum cum capucio de cons[imili ?] liberacione
 faciendum, videlicet, cuilibet eorum iiij ulnas panni rubri
 curti et iij ulnas panni viridis curti, erga dictum viagium. } ij pannos xiiij ulnas panni rubri curti.
 } j pannum xxij ulnas panni viridis
 curti.

Et ad omnes liberaciones predictas de panno viridi longo
 et curto tam dominorum militum quam scutiferorum,
 vallettorum, gacionum et pagettorum, cum una corona
 de panno blank' diversimodo operato pro diversis status
 [sic] secundum ordinacionem consilii Regis operata in
 brouderia et scissor[io ?] cum isto dictamine *Soveraigne*,
 et super garniamenta dictorum dominorum militum scuti-
 ferorum et aliorum predictorum consuta et broudata, erga
 viagium predictum. } j pannum blank' longi.
 } j pannum iij ulnas blank' curti.

Fratri Johanni, de Ordine Minorum, confessori domine
 Regine, pro vestura sua de dono domine Regine erga } vij ulnas panni russett longi.
 viagium suum versus partes predictas.

Venerabili patri Willemo, Episcopo de terra Dacie, uni
 quatuor ambaciatorum Regis dicte terre, ad robas suas
 faciendas et furrur' et purfil' de cons[imili ?] dono dicte
 domine Regine, erga viagium predictum. } v ulnas panni scarlett.
 } v ulnas panni viridis longi.
 } xvij tymbres ventres minever pur'.
 } xxix bestes ermyn.

Tribus dominis ambaciatoribus Regis Dacie venientibus
 in Angliam pro maritagio inter dictum Regem et filiam
 domini nostri Regis Anglie, videlicet, cuilibet eorum v
 ulnas panni scarlett et v ulnas panni viridis longi, de dono
 domine Regine, erga viagium predictum. } xv ulnas panni scarlett.
 } xv ulnas panni viridis longi.

Magistro Petro Luk, Archidiacono Ruskendemer et Andree filio Olavi, militi Dacie, pro vesturis eorum de cons[imili ?] dono domine Regine, videlicet, utrique eorum v ulnas panni scarlett et iiij ulnas panni viridis longi, erga viagium predictum versus partes predictas. } x ulnas panni scarlett.
viiij ulnas panni viridis longi.

fo. 4 d.

Viginti scutiferis de partibus Dacie venientibus cum ambaciatoribus Regis Dacie pro vesturis eorum de dono domine Regine, videlicet, cuilibet eorum v ulnas panni scarlett et iiij ulnas panni viridis longi, erga dictum viagium. } iiij pannos xvj ulnas panni scarlett.
ij pannos xxiiij ulnas panni viridis longi.

Quinque clericis venientibus cum ambaciatoribus Regis Dacie pro vesturis eorum de cons[imili ?] dono domine Regine, videlicet, [cuilibet] eorum v ulnas panni scarlett et v ulnas panni viridis longi, erga dictum viagium. } xxv ulnas panni scarlett.
xxv ulnas panni viridis longi.

Decem valettis venientibus de dictis partibus cum ambaciatoribus Regis [Dacie] pro vesturis eorum de cons[imili ?] dono dicte domine Regine, videlicet, cuilibet eorum iiij ulnas panni viridis curti et iiij ulnas panni rubri curti, erga viagium predictum versus partes predictas. } j pannum xvij ulnas panni rubri curti.
j pannum xvij ulnas panni viridis curti.

Prefato Johanni Dun ad ij dorsoria cum duobus celuris et curtinis de corde blu facienda consuenda et liganda cum rubant fili gr[ossi ?] et pendenda cum corda fili gr[ossi ?] et garnisanda cum anulis de cupro, pro pilis robis et lectis domine Regine, erga transitum predictum versus partes predictas. } x pecias de corde [sic] blu.
v lb. rubant fili.
ix lb. corde fili.
cxl anulos de cupro.

Eidem ad duo traversyn de tartarin blu et albo facienda et liganda cum rubant serici et garnita cum anulis de cupro, pro magna camera domine Regine, et alia pro media camera dicte domine, erga transitum predictum versus partes predictas. } ix pecias tartarin.
viiij uncias rubant serici.
cxx anulos de cupro.

Eidem ad unum dragg de fustiano albo ex utraque parte faciendum et suffarcinatum cum lana, ordinatum factum et consutum pro navi domine Regine. } xlviiij ulnas fustiani albi.
vj petras lane.

Eidem ad cooperiendum ij materacia de corde empto de Thoma Netton et cooperta ex una parte cum tartarin et bokeram ex altera pro lecto domine Regine. } ij pecias di. tartarin.
ij pecias bokeram.

fo. 5.

Eidem ad duo par linthiaminum de tela de Reyns facienda continentes in longitudine v ulnas et iiij telas in latitudine, pro lecto domine Regine erga transitum predictum. } iiij^{xx} ulnas tele lini de Reyns.

Eidem ad iiij linthiamina tele de Reyns' facienda, videlicet, utroque linthiamine continente iiij ulnas di. in longitudine et iiij telas in latitudine, ordinata pro capite lecti domine Regine erga dictum viagium. } xliij ulnas tele de Reyns.

Eidem ad unum par linthiaminum faciendum de tela Champaign' continens in longitudine v ulnas et iiij telas in latitudine, ordinatum et factum pro lecto domine Regine erga transitum predictum. } xl ulnas tele de Champaign.

Eidem ad vj paillett de canabo inde fact' quolibet paillect continente in se xij ulnas canabi ordinat' pro lecto navi domine Regine. } lxxij ulnas canabi.

Eidem ad cooperiendum j currum et wherl garnizandum in diversis partibus tam infra quam extra per baill et alibi prout necesse fuerit, videlicet, ij coopertoria de panno scarlett et ij coopertoria de panno rubro liniata cum Westvall et canabo cerato pro salvo custodiendo tempore pluvie, et ij coopertoria de panno adaureo de Cypro liniata cum bokeram, garnita cum rubant et freng serici, et dictus currus et wherle garnitus infra cum panno adaureo, clavibus de cupro deaureo, coreo rubro, rubant aurei de Venise, et laqueis serici punctatis de roo[?], stuff' cum lana, ordinatus, factus et consutus infra Garderobam domine Regine erga transitum predictum. }
 xiiij ulnas panni scarlett.
 j pannum j ulnam panni rubri curti.
 vij pannos adaureos de Cypro.
 cl ulnas rubant aurei de Venise.
 iiij lb. iiij unc. di. freng serici.
 j lb. iiij unc. rubant serici.
 vj pecias bokeram.
 xlix ulnas di. Westfall.
 cxxxij ulnas canabi per ^{cnam} de vxx
 et ulnam de iiij^{or} quart'.
 v petras lane.

Eidem ad ij cabaigh facienda infra navem domine, videlicet, j cabaigh subtus le hachez et j supra, de canabo cerato et liniata infra canabum cum worstede rubro et ad pendenda supra capud dicte domine Regine cum panno adaureo de Cypro et ad j aliud cabaigh de worstede pro domicellis Regine predictae ordinatum et factum infra Garderobam dicte domine. }
 j pannum adaureum de Cypro.
 j pannum adaureum Racamac.
 ij lectos de worstede minoris assise.
 xiiij pecias de worstede in rotulis.
 cxliij ulnas canabi.

fo. 5 d.

Eidem ad omnia robas et garniamenta predicta pro eadem domina consuenda cum filo et serico et garnisanda cum sindone tartarin rubro aureo et serico ac cerata cum candelarum cera, similiter pro stuffura lectorum, dorsoria costeria et tapeta cum corda et rubant fili gr[ossi ?] et canabo facienda in Garderobam predictam, ad habenda in stauro infra privatam Garderobam ad expendenda cum necesse fuerit. }
 xviiij laqueos serici.
 j peciam sindonis de Tripoli[?].
 iiij lb. viij unc. di. serici.
 vij unc. rubant serici.
 xv lb. viij unc. fili.
 viij lb. corde fili gr[ossi ?]

Eidem ad liberanda in cameram domine Regine ad expendenda cum necesse fuerit in usum ejusdem domine, tam pro corpore [*sic, sc.* tempore] quo fuit in Anglia quam in partibus Dacie. }
 M^l perl.
 xvj unc. di. Spangdeargento deaurato.
 v chapell, schaplett de serico.
 iiij tissut de serico.
 viij ulnas tele de Reyns.
 xviiij ulnas iiij quart. tele de Cham-
 paign.

v ulnas j quart. tele lini Brabanc'; iiij cofras standard' ligata cum ferro; ij par coffrum trussabiles [*sic*]; viij saccos ad pannos; ij mantica de coreo; j dag de coreo; ccc crochettez de ferro; cc hokes de ferro; j martellum de ferro; j colshovell de ferro; j patellam de ferro; j de ferro cathedram plicabilem; j pelvem de laton; j chauffour de cupro; xij par sotularium; ij par boteux; iiij par punceon; iiij materacia.

fo. 6.

Eidem ad facturam unius lecti de panno adaureo de Cypro campo rubro et nigro operato cum floribus carduum, continentis j coopertorium, j tester cum celura integra liniata cum bokeram blu et ligata cum rubant fili, volanc' garnita cum freng serici, vj quissin de eodem panno liniata cum fustiano albo et bokeram, garnita et ligata cum rubant et boton de serico, iiij curtinas de tartarin rubro quolibet continente iiij ulnas di. in longitudine et iiij telas in latitudine, ligatas cum rubant serici et garnitas cum anulis de cupro, ij fustianos utroque continente v ulnas in longitudine et vj telas in latitudine, j cavenac de carde blu continentem iiij ulnas in longitudine et vj telas in latitudine, viij costeria et v tapetes de worstede et pro eisdem costeriis et tapetis ligandis cum rubant fili gr[ossi?]
ac pro dicto lecto pendendo et extendendo cum corda fili, et saccos ad pannum pro dicto lecto imponendo ad carandum cum domina Regina versus partes predictas.

ix pannos adaureos de Cypro.
iiij pecias tartarin rubri.
ij pecias bokeram blu.
ij pecias fustiani albi.
viij costeria } worstede.
v tapetes }
j peciam ix ulnas carde.
ij lb. ix unc. iiij quart. freng serici.
j lb. rubant serici.
viij unc. boton cum tassell de serico.
vj lb. rubant fili gr[ossi?].
viij lb. corde fili gr[ossi?].
cc anulos de cupro.
ij saccos ad pannum.
vj quissin de coreo.

Eidem ad cooperiendos vj quissin de coreo coopertos panni adaurei de Cypro, liniatos cum bokeram blu inde ij quissin longi et iiij curti, ligatos cum rubant serici ordinatos et factos pro curru et wherle domine Regine erga viagium suum versus partes predictas.

ij pannos adaureos de Cypro.
ij pecias bokeram.
xij uncias rubant serici.
viij uncias j quart' boton cum tassell de serico.
vj quissin de coreo.

Eidem ad iiij curtinas de tartarin rubro faciendas et ligandas cum rubant serici et garnitas cum anulis de cupro, pro uno lecto de stauro domine Regine erga transitum predictum.

vj pecias tartarin.
iiij uncias rubant serici.
lxx anulos de cupro.

Eidem ad unum travasyn de tartarin blu et albo pale faciendum et ligandum cum rubant serico et garnisandum cum anulis de cupro, pro capella domine Regine erga transitum predictum.

iiij pecias tartarin.
iiij uncias rubant serici.
lxx anulos de cupro.

fo. 6 d.

Petro Swan, brodatori, ad broudaturam manicarum et collare unius gouni de velvett rubro, operati in broudaria cum perlis, auro de Cypro et serico, ad modum unius rubant circa manicas et collaram dicti gouni, pro Regina erga viagium suum versus partes predictas.

ij ulnas syndonis.
iiij ulnas tele lini Brabant'.
iiij lb. di. auri de Cypro.
iiij uncias auri soldati.
M^lccclxviij perlas; xx uncias perlarum.

Johanni Drayton, pavillonario, ad unum pavillonum pal[?] } ij ulnas worsted in rotulis.
 de carde et Westfall faciendum et consuendum, pro navi } xij pecias vj ulnas carde.
 domine Regine vocate *le Saint Esprit*, ordinatum et } iiij^{xx} xviiij ulnas Westfall.
 factum per dictum Johannem Drayton erga viagium dicte } ij lb. fili diversorum colorum.
 Regine versus partes predictas.

Eidem ad unum pannum de panno adaureo de Cypro, } ij pannos adaureos de Cypro.
 vocato panne destat, faciendum et liniandum cum bokeram } viij uncias freng serici.
 et garnisandum cum frengis serici, ordinatum ad penden- } ij pecias bokeram.
 dum supra capud domine Regine sedentis in mensa erga
 transitum predictum.

Eidem ad unum linthiamen tele lini Brabant' faciendum, }
 continens iiij ulnas di. in longitudine et iiij telas in lati- } x ulnas di. tele lini Brabant'.
 tudine, ordinatum pro robis et garniamentis Regine
 involvendis ad portanda in cameram erga transitum
 predictum.

Eidem pro oblatione facta apud Lynden in Dacia in } ij pannos adaureos de Cypro.
 diebus solempnitatis nuptiarum et coronacionis dicte } ij pannos adaureos Racamat'.
 domine Regine.

Eidem ad cooperiendos vj quissin veteres coopertos de } j peciam satyn blu.
 novo cum satyn blu, pro uno lecto de panno serico blu et
 albo, pro Regina erga viagium predictum.

Eidem ad unum par de fustian' factum pro uno lecto de } ij pecias fustiani albi.
 panno serici blu, utroque continente v ulnas in longitudine
 et vj telas in latitudine, ordinatum et factum erga viagium
 predictum.

fo. 7.

Johanni Dewe, militi, Magistro Curie Regis, Audberno, } viij sellas cum hernesio deaureo.
 Preposito Bergensi, Andree, Preposito Upsalensi, et Petro } viij frena.
 Luk', Archidiacono Roskildensi, officiariis Regis Dacie
 ordinatis ad recipienda ad usum domine Regine robas,
 lectos, sellas, frena, et alia hernesia dicte domine Regine
 Dacie, filie domini nostri Regis, per indenturam inter
 ipsos et Ricardum Clifford, clericum, Custodem Garderobe
 dicte domine Regine, factam.

Scarlett—xix pannos xj ulnas di.

Color[ati?] longi—xxix pannos ix ulnas di. Et remanent j pannus xx ulne, qui vendentur super
 compotum, ulna per medium ad vs., pro xij*l*. xs.

Russett longi—vij ulnas.

Blankett longi—j pannum.

Color[ati?] curti—xx pannos xiiij ulnas di. Et remanent j pannus iiij ulne, qui vendentur super
 compotum, ulna per medium ad ijs. viij*d*., pro lxxiijs. viij*d*.

Blankett curti—j pannum iiij ulnas iiij quart.

Minever pur'.—Dccvij tymbres xx ventres.

Minever gr[is?]
 Terges de grys—xxx tymbres.
 Best' de ermyns—xxiiij tymbres x best'.
 Velvett—viiij pecias ij ulnas.
 Panni adaurei de Cypro—xxxix pannos.
 Panni adaurei Racamat—iiij [pannos].
 Satyn—j peciam.
 Satyn operati cum velvett—iiiij pecias.
 Attaby operati cum auro—ij pannos.
 Tartaryn—xxviiij pecias.
 Sindonis de Tripoli—j peciam ij ulnas.
 Fustiani—v pecias xviiij ulnas.
 Perlez—M^l M^l ccclxviiij perlas xx uncias.
 Auri de Cipro—iiiij lb. di.
 Auri soldati—iiij uncias.
 Rubant aurei de Venis—cl ulnas.
 Serici—iiiij lb. viij uncias di.
 Rubant serici—iiiij lb. vj. uncias.
 Freng serici—vj lb. vj unc. j quart.
 Laqueorum [?] serici—xviiij.
 Tussut' serici—iiij.
 Botons cum tassellis de serico—j lb. j quart. unius uncie.
 Chappelett de serico—v.

fo. 7 d.

Bokeram—xv pecias.
 Carde—xxiiij pecias.
 Lecti de minori assisa—ij lecti
 Costeria—viiij
 Tapetes—v
 In rotulis—xiiij pecias ij ulnas
 Reyns—cxxx ulnas.
 Champagne—lxxx ulnas ij quart.
 Tele lini Brabant'—xviiij ulnas ij quart.
 Westvall—cxlvij ulnas di.
 Canabis—cccxlvi ulnas j quart.
 Filum—xviiij lb. viij uncias.
 Rubant fili—xj lb.
 Corde fili—xxv lb.
 Materasse—iiiij.
 Lanum—xj petr.
 Coffre standarde ligate cum ferro—iiiij.
 Coffre trussabiles—ij par.
 Quishins de coreo—xij.
 Saccos ad pannum—x.
 Mantica de coreo—ij.
 Bagges de coreo—j.
 Crochettes de ferro—ccc.
 Hokes de ferro—cc.
 Martellum de ferro—j.

de worstede

Colshovell de ferro—j.
 Patella de ferro—j.
 Cathedra de ferro plicatilis—j.
 Pelvis de laton—j.
 Chauffour de cupro—j.
 Sotulares—xiiij par.
 Boteux—iiiij par.
 Pinceon—iiiij par.
 Anuli de cupro—Dc.
 Spang de argento deaureo—xvj uncias di.
 Mantella hiberna—ij.

Exchequer, K. R., Wardrobe, Ble. 405, no. 12; a file of documents.

1. July 15, 7 Hen. IV, 1406.—Henry IV to [William Loveny], treasurer assigned for 'nostre treschere et tresamee fille Phelippe, Royné de Denmark et de Swece'. We have assigned our cousin Richard 'Deuerwyk' to accompany our said daughter to the said kingdoms, for the accomplishment of the marriage, at daily wages of 5 marks for one quarter of a year.
2. July 17, 7 Hen. IV.—Receipt by Monsieur Richard 'Deuerwyk', brother to the Duke 'Deuerwyk', from William Loveny, treasurer for 'ma dame Philippe, Royné de Danmark et de Swece', for his wages for one quarter, viz. £303 6s. 8d.
3. July 21, 7 Hen. IV.—Henry IV to William Loveny, treasurer, etc. Warrant to pay Henry [Bowet], bishop of Bath and Wells, assigned to accompany our daughter, etc., wages of 5 marks a day for one quarter of a year.
4. July 26, 7 Hen. IV.—Receipt by Henry, bishop of Bath and Wells, for £303 6s. 8d.
5. July 15, 7 Hen. IV.—Henry IV to William Loveny, treasurer, etc. Warrant to pay Henry, Lord Lescrop of Masham, assigned to accompany, etc., wages of 40s. a day for one quarter of a year.
6. July 20, 7 Hen. IV.—Receipt by Lord Lescrop for £162.
7. Aug. 16, 7 Hen. IV.—Henry IV to William Loveny, treasurer, etc. Warrant to pay to Piers de Bukton and John de Bukton, his son, chivalers, £100 for their wages and reward for going in the company of our daughter to Denmark.
8. Aug. 21, 7 Hen. IV.—Receipt by Monsieur Piers de Bukton, steward of the household [*l'ostell*] assigned for the queen of Denmark and Swece, for £100.
9. July 21, 7 Hen. IV.—Henry IV to William Loveny, treasurer, etc. Warrant to pay to Walter Hungerford, chivaler, sheriff of Wilts, chamberlain of our said daughter, 100 marks for his wages and reward for accompanying, etc.
10. July 10, 7 Hen. IV.—Receipt by Richard Clifford, 'gardrober' of the queen of Denmark, for £33 6s. 8d.
11. July 31, 7 Hen. IV.—Indenture recording the delivery by William Loveny to Richard Clifford, 'gardrober' of the queen, for the voyage to Denmark of 'un lit de satyn blank overes en braudarie avec lez armez nostre seigneur le Roy, contenaunt un covertour, un tester oue entier ciel, troys curtyns de tartarin blank batuz oue mesmes les armez, sys quissyns, sys tapites blankes ouere en tapecerie avec les lettres de M corones, un piece darras ouere

VOL. LXVII.

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dor que commence *Pur signesion demonstrer*, contenaunt tresze aunez et demy en longure et troys aunez et trois quaters en laeure, un piece darras ouere dor que commence *Che listore es de grant renon*, contenant tresze aunez en longure et quatre aunez en laeure, et un piece darras ouere dor que commence *Vees chevauchier cel vassal*, contenant dys aunez en longure et quatre aunez en laeure'.

12. July 16, 7 Hen. IV.—Indenture between 'Madame de Watterton, Maistresse de Roigne de Danmark', and Richard Clifford, clerk, 'gardrober du dite Madame la Roigne'. Clifford has delivered to Lady Watterton 'Mⁱ perles pur embrauderer et certeine oueraigne affaire sur le coler et maunches dun gown de dite Madame la Roigne'.
13. June 12, 9 Hen. IV, 1408.—Henry IV to the treasurer and barons of the Exchequer, as to the wages of Richard Clifford, 'nadgaires garderober de nostre tresamee fille Philippe, la Roigne de Denmark, Norway et Swece'.
14. June 15, 8 Hen. IV, 1407.—Same to same, as to Clifford's accounts.
15. July 21, 7 Hen. IV, 1406.—Henry IV to William Loveny, treasurer, etc. Warrant to pay to 'le Baroun de Wemme', assigned to accompany the Queen, etc., £20 for his wages and reward for one quarter of a year.
16. July 26, 7 Hen. IV.—Receipt by Walter Hungreford for £66 13s. 4d., for his wages and reward for accompanying, etc., for one quarter of a year.
17. July 23, 7 Hen. IV.—Receipt by Thomas Molyngton, baron of Wemme, for £20 for his reward for one quarter of a year, etc.
18. July 27, 7 Hen. IV.—Henry IV to William Loveny. Warrant to pay to Richard Clifford, clerk, 'gardein de la Garderobe de mesme nostre fille, cynquante marcs pur ent faire provision de certaines choses necessaires pur l'apparaill de nostre fille susdite'; also 100s. to our serjeant of arms, Johan Peraunt, a reward for going abroad with the Queen.
19. July 10, 7 Hen. IV.—Receipt by Richard Clifford for £33 6s. 8d. [no details].
20. Aug. 11, 7 Hen. IV.—Henry IV to William Loveny. Warrant to pay to Richard Clifford £20 in part of his wages and reward.
21. May 12, 8 Hen. IV, 1407.—Henry IV to William Loveny. Warrant to pay to 'Johan Elmeton, clerck de nostre niefs, facez paier dys livres sur lamendement et appareillement dune nief appelee *le Holygost*, de quelle Johan Maihewe est meistre, et la quelle nief estoit ordennez pur conduyre icelle nostre fille a lez partes de Denmark et Swece predites'.
22. July 18, 7 Hen. IV.—Henry IV to William Loveny. Warrant to pay to 'Katerine la femme de nostre trescher et foial Chevaler Hugh de Waterton, Mestress a nostre dite fille, et a Dame Anne Lisle' assigned to accompany, etc., to each 'sessante livres' now and 'en port de Lenne sur lour passage, quarante livres', in full payment for their wages and reward.
23. Aug. 8, 7 Hen. IV.—Receipt by Katherine Waterton, 'Meistress a la treshonoree Dame la Roigne de Denmark et de Swece,' for £100, in full for her wages and reward for one quarter of a year. Dated at Lenne.
24. July 24, 7 Hen. IV.—Receipt by Dame Anne Lisle for the like £60. Dated at London. Further receipt £40. London, 1 Aug.
25. January 25, 9 Hen. IV, 1407-8.—Henry IV to ——. Warrant to pay to Anne de Lisle a further £26, 'pur les costages de ele et de ses gentz venantz de Bamburgh tanque a nostre citee de Londres puis lour arrivaille en Engleterre venantz de les parties de Denmark'.

26. August 8, 7 Hen. IV.—Henry IV to William Loveney, treasurer of Philippa, queen of Denmark. Warrant to deliver to the Queen or to such person as she shall assign certain articles lately delivered to him by Thomas Nevill, Sire de Fournivall, treasurer of England, namely:—ij chandellers, j paxbred susorrez, pois ij lb. xj unc. de pois de troie. Item, j peire cruettes, j sonette d'argent les parcelles enorrez, pois ix unc. j q^r de mesme le pois. Item, ij salers d'argent et enorrez pois iij lb. ij unc. di. de dit pois. Item, ij salers d'argent coverez dount les parcelles enorrez, xij quillers blanc d'argent, pois iij lb. vij unc. j q^r de pois de troie. Item, j pot d'argent susorrez, pois iiij lb. x unc. de pois de troie. Item, un autre pot d'argent susorrez, pois viij lb. v unc. de mesme le pois. Item, ij pottes d'argent blanc, pois vj lb. j unc. de mesme le pois. Item, j hanap susorrez coverez oue les armes d'Engleterre ovesque j bordure, pois ij lb. j unc. et di. de mesme le pois. Item, j hanap susorrez pounsez oue j egle, pois j lb. et di. de pois de troie. Item, xij hanaps d'argent, pois viij lb. di. unc. de pois de troie. Item, ij quillers susorrez, pois iij unc. di. et di. q^r de mesme le pois. Item, xij esquelles d'argent, pois xvij lb. j unc. et di. de pois de troie. Item, xij esquelles d'argent, pois xvij lb. ij unc. et di. de mesme le pois. Item, xij esquelles d'argent, pois xv lb. ij unc. de mesme le pois. Item, xij esquelles d'argent, pois xv lb. viij unc. de mesme pois. Item, iiij chargeours d'argent, pois xij lb. ij unc. et di. Item, xxiiij saucers d'argent, pois xij lb. v unc. de pois de troie. Item, j spiceplate susorrez, pois iij lb. vij unc. de mesme pois. Item, ij spiceplates d'argent parcell enorrez, pois iiij lb. v unc. de dit pois. Item, ij chandellers susorrez, pois iij lb. j unc. iij q^r de pois de troie. Item, ij chandellers d'argent parcell enorrez, pois iij lb. j unc. de dit pois. Item, j peire bacyns coverez susorrez, pois x lb. viij unc. de pois de troie. Item, j peire bacyns coverez les parcelles susorrez, pois ix lb. ix unc. de mesme le pois. Item, j peire bacyns parcelles enorrez oue ij ewers d'argent, pois xij lb. iiij unc. et di. de pois de troie.
27. Fragment; illegible.
28. January 18 [? 8 Hen. IV, 1406-7].—Appointment of William Loveny to sell all remaining victuals, etc. *In bad condition; partly illegible.*
29. August 2, 7 Hen. IV.—Indenture between William Loveny and Thomas Nevill, Lord de Fournyvall; a receipt by Loveny for the articles mentioned in no. 26.
30. July [? 22], 7 Hen. IV.—Appointment of Ralph Ramesey [? to do what]. Recites that Loveny was charged to see to the safe conduct of Philippa, her lords, ladies, knights, esquires, grooms [*valetti*], and others, to the parts of Dacia, and for the return of the lords, etc. *In bad condition.*
31. July 22, 7 Hen. IV.—Appointment of William Loveney as treasurer of Queen Philippa, for her voyage, etc.
32. February 14, 10 Hen. IV, 1408-9.—Henry IV to William Loveney. We have of our special grace granted to Philip Gylder, John Warton and Thomas Middelham, who attended Queen Philippa to Denmark, 'deux tonneulx et un pip de vyn et cynque barelles de beer de la remenant de quelles ordennez pur mesme nostre fille pur son aler a les parties susdites'.
33. November 2, 8 Hen. IV, 1406.—Presens indentura facta apud Lunden in Dacia secundo die Novembris, anno regni Regis Anglie Henrici quarti post Conquestum octavo, testatur quod Johannes Dwe, miles, Magister Curie Regine Dacie, Swecie et Norwagie, Audbernus, Prepositus Bergensis, Andreas, Prepositus Upsalensis, Petrus Lukke, Archidiaconus Roskildensis, receperunt de Willelmo Loveney, Thesaurario excellentissime domine, Domine Philippe, Regine Dacie, Swecie et Norwagie, jocalia, vasa argentea, et alia diversa ornamenta subscripta.

Pur la Chapell { Primerment, j par chandelerz d'argent suisorrez.
j paxbrede d'argent suisorrez.
j par cruettes d'argent.
j sonette d'argent.

Pur la Panetre { ij salers coverez d'argent suisorrez.
ij salers coverez d'argent parcelles suisorrez.
ij quillers d'argent suisorrez.
xij quillers d'argent.

Pur le Butillerie { ij pottez d'argent suisorrez.
ij pottez d'argent plein.
j hanap d'or plein.
j hanap haute d'or ponsone.
j hanap de berill garnicez d'or et j ewar de mesme la suyte.
j hanap covere d'argent suisores et ouere ou lez armes d'engleterre ouesque une bordure.
j hanap couere d'argent suisorrez.
xij hanaps d'argent.
iiij hanaps d'argent.

Pur le Squillerie { xij esquillez d'argent.
xij esquillez d'argent.
xij esquillez d'argent.
xij esquillez d'argent.
iiij chargeours d'argent.
xxiiij saucerrrs d'argent.

Pur le Spicerie et Chaunder { j spiceplate d'argent suisorrez.
ij spiceplatez d'argent parcelles suisorrez.
ij chaundelers d'argent suisorrez.
ij chaundelers d'argent parcelles suisorrez.

Pur l'eawarie { j par bacyns d'argent suisorrez et chacez.
j par bacyns d'argent suisorrez.
j par bacyns d'argent.
ij bacyns d'argent oue ij eawars d'argent.
ij bacyns d'argent rondéz.

Pur l'aumerie { j almousdissh d'argent suisorrez en guys d'une nief.

j front, j contrefront, j par ridels, j parure, j cope, ij aubes, ij amites, ij fanons, ij stoles,
j chesible, ij tunicles, j touall, j drap pur la lettron, j corporax deins une cas, j chalys,
ij cruettes d'argent, j superaltar et j pewe.



Fig. 1. Portion of reredorter from south

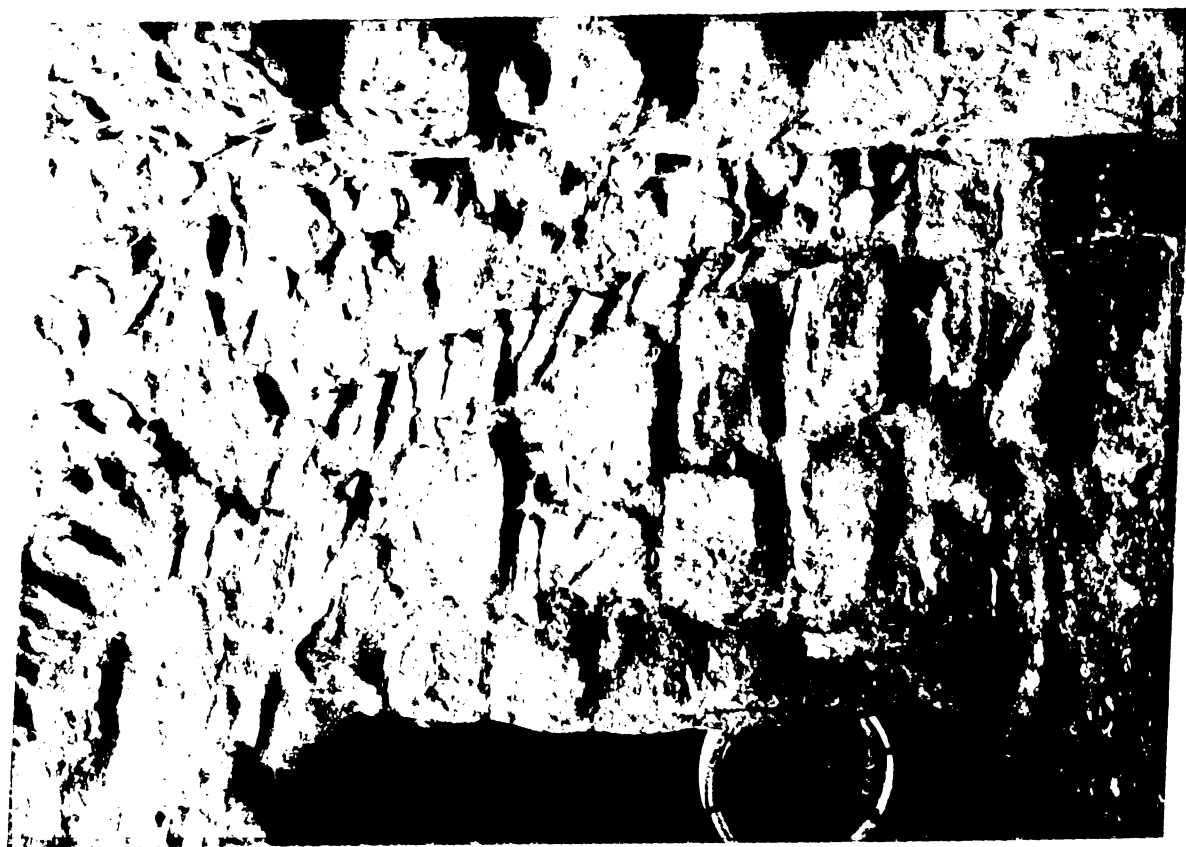


Fig. 2. North-east corner of dorter subvault

IX.—*On the Dorter Range at Worcester Priory.*

By HAROLD BRAKSPEAR, *Esq., F.S.A.*

Read 17th February 1916.

FROM the earliest times every monastery had buildings for different purposes used regularly by the inmates. The chief of these in the course of time and with the experience of use came to be systematically placed with respect to one another, and the plan of a square court surrounded by the chief buildings of the convent quickly became general.

At the Conquest the Benedictines had a regular plan for their monasteries. The church was on the north or south side of the court or cloister as necessitated by the lie of the ground for drainage purposes; the parlour, chapter-house, and warming-house were on the east side, with the dorter over the latter; the frater was on the opposite side to the church; and the west side was sometimes occupied by guest-houses. The infirmary, like a great church, was usually to the east.

There were, however, exceptions to this arrangement caused by the exigencies of the site; and the monastery of Worcester, with the church and other buildings placed on high ground east of the river, is one of the most noticeable. The parlour is in its normal position next the transept of the church; but the chapter-house is circular and occupies the rest of the east side of the cloister. The frater is in its usual position opposite the church, but the west side of the cloister is without parallel. Next the south side of the nave is a passage which led to the infirmary, and nearly the whole of the rest of this side of the cloister was occupied by the end of the great dorter, which ran westward towards the river. There was a further block of buildings at its west end, right up to the river bank, containing the reredorter and part of the infirmary.

This great dorter was one of the first buildings to be erected after the eastern part of the church had been completed by Wulstan. Except in its position, it was very like that at Christ Church, Canterbury, having two parallel roofs and being raised upon a subvault. The subvault measured 123 ft. in length by 63 ft. in width, and of it remain, besides the east wall which forms the west side of the cloister, a portion of the north wall, with a fragment of the south, and the whole

of the west, but this latter has been so much patched at different times as to show little or none of its original surface.¹

From these fragments the nature of the subvault may be traced. It was divided by a wall 5 ft. thick which was pierced with arches, and each half so formed was divided into two alleys of eight bays. The bays were marked on the side and end walls by shallow pilaster strips having a chamfered abacus at the springing but without any plinth. These strips carried the cross-arches of the vault, and a small square member in their angles took the springer of the vault itself, which was unribbed. The centre columns were probably similar to those in the crypt of the cathedral.

The floor of the subvault was at one level throughout, which was 9 ft. below the present level of the cloister.

The original entrance seems to have been in the sixth bay of the cloister, and was altered in the thirteenth century to the low semicircular arched doorway which still remains. The use of the subvault will be considered later.

Of the original dorter nothing remains but the east wall to some 6 ft. above the floor and the blocked entrance archway from the cloister. This centres with the middle of the northern division of the subvault, in order that the steps may have room to rise within the pocket of the vault. Towards the cloister this entrance has two members, a square and a circular one, of which the latter is supported on jamb shafts, with cushion capitals and moulded bases. The arch is 6 ft. wide, with the springing 11½ ft. above the floor, and the reason of these tall proportions was to clear the rising steps up to the dorter level. There is no rebate for a door, and the lines of the arch on either side of the wall correspond with each other.

There is nothing to show whether the wall separating the two halves of the dorter was solid or pierced by openings.

The outer walls of the dorter range are faced inside and out with alternating wide and narrow courses, which show very clearly in the remaining walls of the subvault on the north side, in the cloister, and externally at the west end.

The Worcester annalist says (under the year 1302):

Secundo idus Iulii magna pars ruens in dormitorio nostro quae multo tempore ruinam minabatur nostram negligentiam manifestat.²

As shown by the remains of the subvault, the main walls of that building were not interfered with, though the vaulting at the south-west angle was possibly destroyed, but the fall was otherwise restricted to the dorter itself and was doubtless exaggerated. Whatever damage was done was patched up temporarily, as

¹ The Canterbury subvault was 140 ft. by 84 ft., and was placed north and south in the normal position adjoining the east side of the cloister.

² *Annales de Wigornia* (Rolls Series, 36, vol. iv, 552).

otherwise it is difficult to understand the rebuilding which occurred in 1375-7, when it is recorded

post festam Epiphanie inceptum est opus novi dormitorii per fratrem Ricardum Wenlocke cellerarium sed illud opus minime adimplevit: conventus interim in camera Regis sub et supra cubavit.¹

Two years later (1377)

mense Augusti novum dormitorium cum lectis sub fratre Willelmo Power cellerario consummatum et circa festum Nativitatis beate Virginis conventus in eo cepit dormire.¹

The new dorter was built on the old subvault, and so was externally the same size as the original, but the side walls were thinner. Little of this building remains except the portion of the north wall forming the south side of the infirmary passage. In the north-east angle is a carved corbel to carry the roof principal, and there are three others, but with their projecting parts chopped off.

The dorter roof was still of two divisions, supported down the middle on nine great stone pillars, corresponding with the seven detached pillars of the subvault and the two responds. The roofs were covered with lead. The end gables, save the western of the northern half, would each have large windows to light the two divisions.

The original entrance was reduced in size by the insertion of a four-centred arched doorway of the date of the rebuilding, which seems to have formed the access to the dorter for some time. As there is a rebate for a door on the west side, there must have been a landing before the dorter steps began to ascend, which would prevent the steps being contained, as hitherto, in the pocket of the vault.

In the east wall of the dorter, next the north angle, is a small moulded doorway that led to a vice, contained in the thickness of the wall, which ascended to a room over the infirmary passage. This room was added in the fourteenth century but has been destroyed. Only the springers of the vault on the north side and the bottom stones of the entrance in the south-east angle remain. The vault was of four bays with four-centred ribs springing from a point, precisely similar to those remaining in the lobby and wardrobe of the treasury. It has been suggested that this room was the library built in 1377, but its access through the dorter precludes such a surmise, and its use was more probably for one of the officials.

A monastic dorter was not arranged like a school dormitory with an unprotected row of beds on either side, but each monk had a separate cubicle or cell to himself.

¹ Cathedral Library, *Edificiorum Chronologia*, A. xii, 77.

In the Cistercian house of Clairvaux these were—

faictes de menuiserie seulement, contenant, de longueur, de sept à huict piedz et, de largeur, six piedz, en toutes lesquelles y a ung chalit, le lict dessus, ung petit comptoir et ung poulpitre pour escrire, et sont lesdictes chambres, ornées et accoutrées de belles ymages en toille et tableau selon la dévotion d'ung chacun religieulx.

Item. En chacun des huisse d'icelles chambres y a une fenestre à deux bareaux, par laquelle ung chacun religieulx, allant par les dortoirs, peult veoir son compaignon en sa chambre;¹

The cubicles at Netley and Cleeve were about 7 ft. wide and at Jervaulx 6 ft. At Durham—

Upon the West syde of the Cloyster there was a faire large house called y^e Dorter where all y^e Mounkes and y^e Novices did lye, every Mouncke having a litle chamber of wainscott verie close severall by themselves and ther wyndowes towards y^e cloyster, every wyndowe servinge for one Chambre by reasonne y^e perticion betwixt every chamber was close wainscotted one from another, and in every of there wyndowes a deske to supporte there bookes for there studdie; In y^e weste syde of y^e said dorter was y^e like chambers and in like sort placed with there wyndowes, and deskes towards y^e fermery and y^e water, the chambers beinge all well bourded under foute.

Also the novices had there chambers severall by himselfe not so close, nor so adioyninge [in the South-end of the said Dorter] to the foresaid chambers havinge eight chambers on either side, every novice his chamber severall by himselfe, not so close nor so warme as the other chambers was there was no windowes to give light but as it came in at the foreside of the said chambers, of the said novices beinge all close els both above and at either side. In either end of the said dorter was a 4 square stone, wherin was a dosen cressetts wrought in either stone beinge ever filled and supplied with the cooke, and they needed to give light to the monkes and novices when they rose to there Mattens at midnight and for their other necessarye uses.²

At Worcester the cubicles would be placed along each side wall and have two rows down the middle. If these were the same width as the Cistercian examples just quoted, there must have been two cubicles in each bay or sixty-four in all, but probably two half-bays were kept clear for communication between the two halves of the dorter, in which case the total number of cells was sixty, or ten cells for novices in addition to those for the fifty monks instituted by Wulstan.³

A new entrance was made to the dorter in the fifteenth century, in the fifth bay of the cloister from the north. This is a great doorway 7½ ft. wide, having six irregular members of which the three inner are finished by a three-centred arch, and the remainder are carried up straight and returned as a flat lintel. There are blank shields in the spandrels thus formed. The capitals are very

¹ Didron, *Annales Archéologiques*, iii, 228.

² *Rites of Durham* (Surtees Society, cvii), 85.

³ *Archaeological Journal*, xx, 11.



Fig. 1. Original dorter entrance from cloister

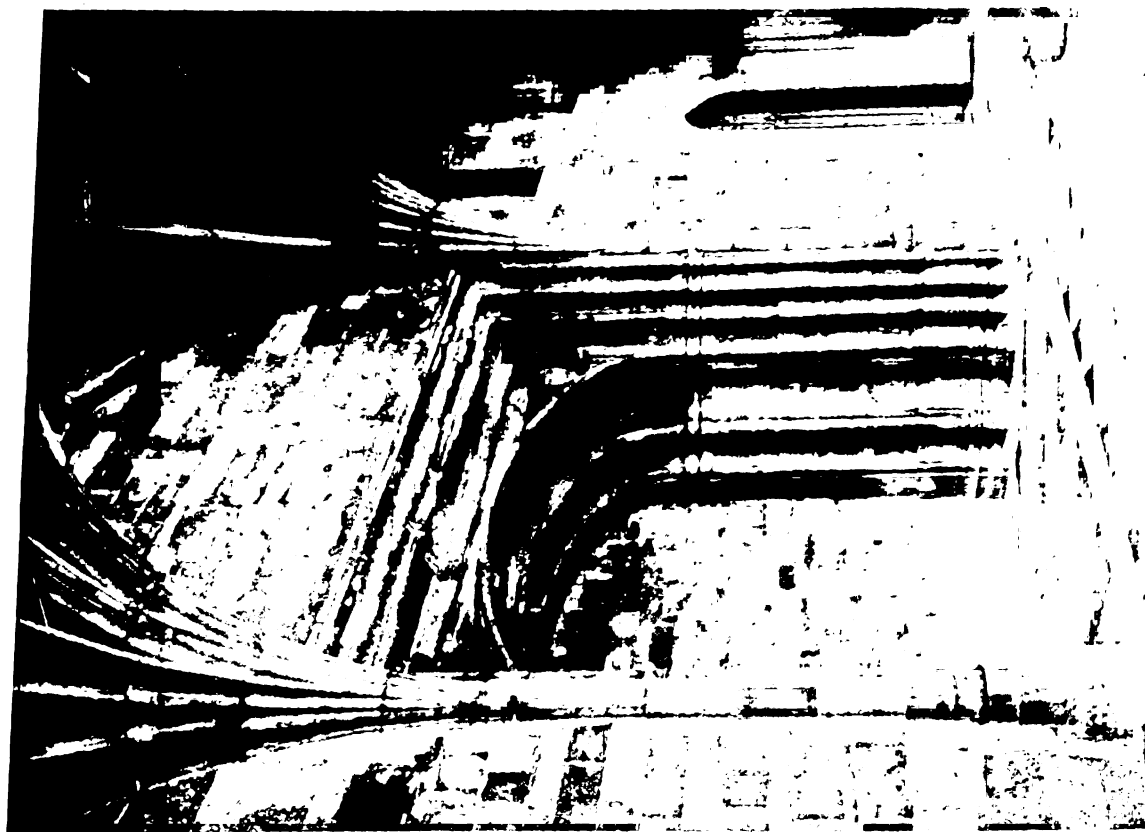


Fig. 2. Later dorter entrance

small and are formed with a continuous moulding at the springing of the arch. This entrance occurs in the middle of a bay of the subvault which must have been destroyed for a square lobby inside the doorway. The steps to the dorter level appear to have run up northward and were lighted by two inserted loops in the fourth bay of the cloister. Beneath these loops is a plain arched doorway with a two-light window to the north covered by a construction arch on the west side. This doorway and window were apparently inserted to give access and light to the space under the new stairs to the dorter.

When these alterations were made it is probable that a new flight of steps was put down to the subvault from the lobby inside the dorter door, and the old doors in the second and sixth bays of the cloister built up.

The priory of Worcester was suppressed on the 16th of January 1540, but as the change of officers between the dissolved monastery and the newly licensed cathedral body was one in name only, none of the monastic buildings was plundered and not even the dorter, which ceased to be occupied, was pulled down.

As late as 1642 repairs to the lead of the dorter were being done.¹ In 1649 it was described by the Parliamentary surveyors as—

A spacious Room or howse called the Dormitory built with strong Walls the floore thereof being earth contains in breadth 62 foote and in length 105 foote only there is taken out of one corner 11 foote and 2 inches in breadth and 15 foote and 2 inches in length which is used with the house belonging to Mary Bellers aforesaid adjoining, in the midst of the said Roome are 9 great stone pillars extending east and west in the length thereof bearing up the Cover. The Cover of the said Dormitory is of lead being in breadth 70 foote and in length 105 foote.

Under the Dormitory there is a vault in which there is a passage to Divers Roomes called the Darke Alley and some of Dwelling roomes on both sides the said Darke Alley, viz. Sara Drew widdow holdeth there at will one habitation consisting of a haule a chamber and 2 little roomes over late Nathaniell Marstons alias Masons one of the petty Cannons.

Richard Brown late petty Cannon holds at will 2 lowe Roomes and a Chamber over them both which said Dwellings are on the south side of the Said Darke Alley under the said Dormitory.

One other Roome under the said Dormitory on the north side in the possession of An Old Woman called by the name of poore Anne.

Another roome on the same North Side Under the said Dormitory in the possession of William Marten who holds the same at will.

The Dormitory is for no other Use but to be valued by the Materialls, viz. The Lead £163. The Tymber £7. and therefore the poore Dwellings under it not valued.²

The lead and timber were removed during the Rebellion, and the dorter and subvault allowed to go to ruin. In 1671 the chapter ordered—

¹ Cathedral Library, A. xxvi.
VOL. LXVII.

² In Chapter Clerk's Office, *Book of Manors*, 1649, p. 264.
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That the ground where the Dormitory and other buildings formerly stood commonly called the dark alley be allotted for two gardens between Dr. Benson and Mr. Reynolds, the upper part for the said Dr. Benson and the other part for the said Mr. Reynolds.¹

The south wall of the subvault is said to have been standing to double its present length as late as 1848.²

After the destruction of the prebendal houses at the beginning of the last century the site of the dorter was thrown into the garden belonging to the house of the third stall, now occupied by the Rev. Canon Wilson, D.D.

Canon Wilson made certain excavations on the site as soon as he came to Worcester, but without much success. In 1912, in consequence of a grant from the Society of Antiquaries, further excavations were made by the writer, which revealed the pilasters of the subvault against the east wall to their full depth and showed clearly how that end was originally treated. At the same time the western part of the north wall of the subvault was traced and cleared to the original level.

In the middle of the east end of the subvault is a pilaster to take the end arch of the series down the midst of the range which divided it into two equal parts. The pilaster is 5 ft. wide, flanked by small square members to take the vault itself, and built of squared stones.

Under the original dorter door is another pilaster, but only 2 ft. 11 in. wide, with similar small members in the angles, and this was to take the narrower arches subdividing the northern half of the subvault.

The northernmost bay has the angle shaft to take the vault with its chamfered abacus complete. The original design of the vault was intended to have the apex only 5½ ft. above the springing, but this was abandoned and the completed vault had its apex 18 in. higher; the space between the intended line of vault and that executed being filled with small stones laid aslant.

The vault was unribbed but had cross and longitudinal bands constructed in the rubble, similar to those in St. Wulstan's crypt beneath the presbytery.

On the north side of the subvault the easternmost and half the next bay remain. The peculiar deep and shallow coursing of the walling-stones shows clearly in these bays, as does also the alteration in the height of the vault. In the middle of the easternmost bay is an inserted doorway 3 ft. wide, having a segmental head and rebate for a door. Through it are steps from the subvault to the infirmary passage, towards which it is finished by a round-arched doorway. In the thickness of the wall is the beginning of a staircase 2¼ ft. wide ascending westward, either to the dorter or to the space over the passage; but this was destroyed when the dorter was rebuilt in the fourteenth century.

¹ Cathedral Library, A. lxxiv, 107.

² Professor Willis, *Archaeological Journal*, xx, 269.



Fig. 1. Windows of reredorter subvault

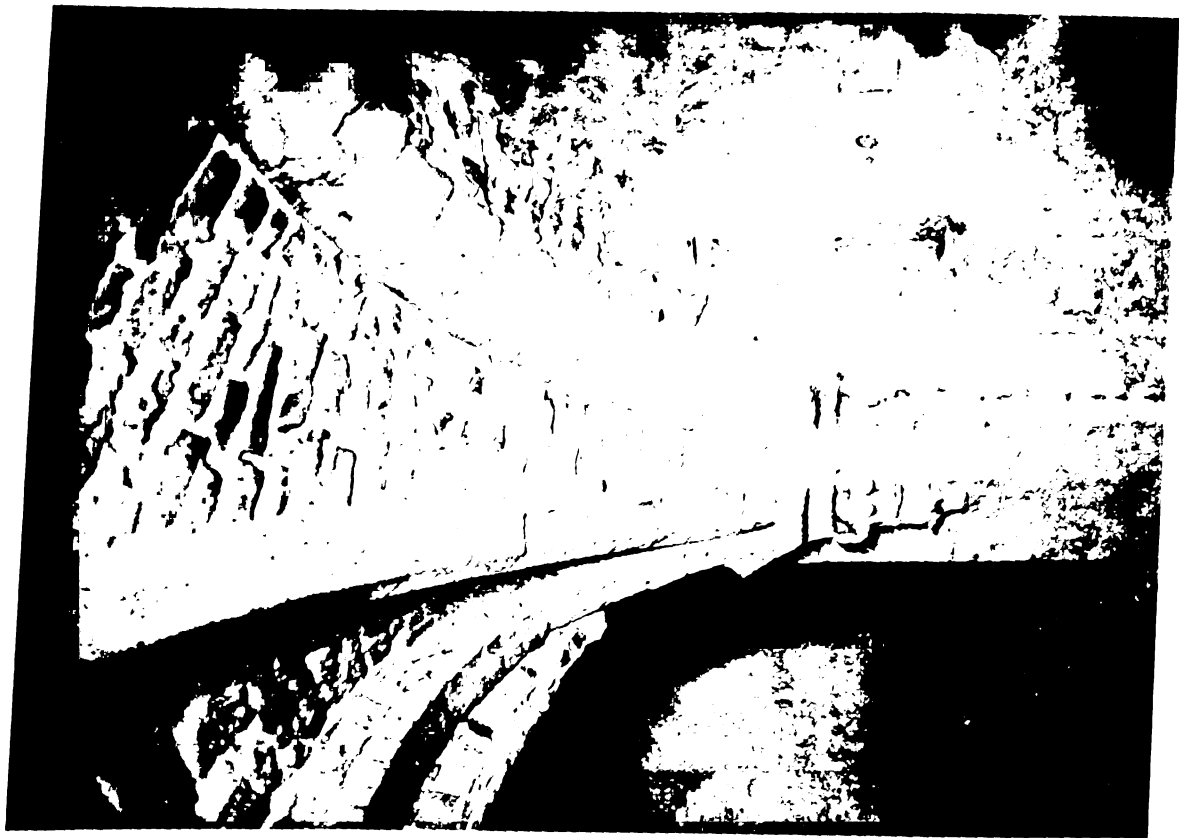


Fig. 2. Springing of vaulting, reredorter subvault

Only 4 ft. of the second bay remain, and where this ceases in the infirmary passage is a pointed doorway which seems to have led up by steps to the dorter floor. Beyond this westward the subvault wall has been destroyed by modern casing. There is, however, a round-headed doorway in the infirmary passage through which steps must have led down to the subvault in the third bay.

The portion of the north wall of the subvault investigated in 1912 was found to be standing some $4\frac{1}{2}$ ft. above the floor-level. Broken masonry marked the positions of the first and second pilasters from the west. In the middle of the bay uncovered were the remains of the original window, 4 ft. in the clear, with slightly splayed jambs. There was an inserted fireplace on the east side of this bay. The footings of the wall projected internally $15\frac{1}{4}$ in. to take the pilaster strips. Externally the wall was plain, without any signs of buttresses, and faced with fair ashlar.

There was a floor of old bricks at the original level and a second and much later floor 3 ft. above this.

The two western bays of the south side of the subvault remain and show a number of interesting features.

The original twelfth-century pilasters, with angle members and abacus, are left; but everything else seems to have been renewed at the rebuilding of the dorter in the fourteenth century. The vault was then made with semi-octagonal cross and diagonal ribs, 11 in. wide, of depressed segments. The springing stones of the ribs remain on the westernmost pilaster, and the toothing of the vault remains in the second bay and is a pointed segment. Externally each bay was divided by buttresses 2 ft. wide, of which the toothings remain; they were probably similar to that remaining complete opposite the west wall.

Both the westernmost and the next bay have two-light windows on the east side, but different from each other. In the former the window is of two cusped lights with a square head, and in the latter is a tall pointed window of two lights with a quatrefoil in the head. Next to this is a rough recess, which may be the flue of a fireplace.

As already stated, the west wall of the subvault remains but has been hopelessly interfered with by modern casing. The southernmost bay has a pointed segmental opening, next the south wall, reaching to the under side of the vault through which a staircase seems to have ascended.

Just to the north is a second doorway with a pointed head that leads to the buildings on the west.

The pilaster in the middle of the southern half of the subvault is marked by a shallow buttress against the wall. Northward of this are the remains of one of the original windows, of which the springer is $8\frac{3}{4}$ ft. above the floor and the sill $2\frac{3}{4}$ ft. The jambs are square, 4 ft. apart, and formed of squared stones; unfortunately, the external jambs and arch are destroyed.

Farther northward the wall seems to have been rebuilt, though the middle row of arches down the subvault is indicated by brick facing; it is out of square with the dorter range and not parallel to the outer face of the original wall.

The use of the dorter subvault in Benedictine houses was chiefly for the warming-room or common house, but at Westminster and Durham there were in addition the treasury and the great cellar of the buttery; therefore at Worcester, with a much larger subvault, it is unlikely that the common house occupied the whole area. The treasury was elsewhere, so that could not have helped to occupy the space, and the subprior's lodging coming between the buttery and dorter prevented the great cellar being in this position. The infirmary being always small, it is probable that a great part of the subvault was used in connexion with that establishment.

The common-house would occupy the five eastern bays of the southern division, and was entered by the little round-headed doorway in the sixth bay of the cloister and lighted on the south side beyond the subprior's house.

At Durham

was y^e commone house and a Maister therof the house being to this end, to have a fyre kept in yt all wynter for y^e Mounckes to cume and warme them at, being allowed no fyre but that onely. Except y^e Masters and officers of y^e house who had there severall fyres. Ther was belonging to y^e common house a garding and a bowlinge allie on y^e Backe side of y^e said house towards y^e water for the Nouyces Sume tymes to recreat theme selves when they had remedy of there Master he standing by to se ther good order.¹

At Worcester, the level piece of garden southward of the dorter probably marks the position of the bowling alley.

The three eastern bays of the northern division must have been mere cellarage, owing to the absence of light, leaving the rest of the subvault for uses in connexion with the infirmary.

With all orders towards the beginning of the fourteenth century the officers of the monastery sought greater privacy than in earlier days and procured separate chambers whenever possible, and these were usually in the infirmary, where the rules were considerably relaxed. At Westminster the infirmary hall was pulled down and a small cloister built in its stead surrounded by sets of rooms. At Worcester the dorter subvault was in the fourteenth century divided into chambers which have left remains in the two western bays and were actually occupied as dwellings at the time of the Rebellion.

In connexion with all monastic dorters was the great reredorter or *necessarium* of the monks, but this building was placed in a variety of ways with respect to the dorter.

¹ *Rites of Durham*, 88.



Fig. 1. East end of Song School



Fig. 2. West wall of dormer in reredorter subvault

At Canterbury (Christ Church) and Durham it was at right angles to the dorter, at Bardney it adjoined at the east side of the south end and continued southward; at the Cluniac priories of Lewes and Castle Acre it was placed across the end of the dorter range and connected by a bridge; in the Cistercian houses of Furness, Neath, and Margam it was parallel to the dorter and reached therefrom by a bridge.

There were three distinct arrangements of these buildings: the one and most usual was to have the seats along one side over the drain; the second, as in the lay brothers' reredorter at Fountains and Jervaulx, was to have the seats back to back down the middle of the room; and the third, as at Westminster and Durham, was to have the closets against each side wall.

The reredorter was invariably on the same level as the dorter, and its sub-vault was used for various purposes.

At Worcester the reredorter occupied the top floor of a three-storied building running out westward in line with the northern half of the dorter. This building is considerably ruined, but enough remains to trace its general arrangements. It is of two dates; the south wall and drain belong to the reredorter built shortly after the dorter was finished, and the rest is of the later years of the twelfth century.

The north wall of the original reredorter was in line with the north wall of the dorter, or 2 ft. to the south of the present wall, and the west end seems to have projected farther out into the river. There is on the south side of the reredorter a two-storied aisle.

The ground floor of the main block and the aisle is a subvault; the first floor, some 3 ft. below the dorter subvault, was, in the words of the parliamentary survey, 'Another Darke roome at the Lower end of the Dormitory called the Infirmary'.¹

The mixing up of reredorter and infirmary was by no means an uncommon arrangement, notably in Cistercian houses. At Furness, Waverley, and Fountains the lay brothers' infirmary connects directly with the reredorter, and in the first instance the wall of the pit of the drain is the wall of the infirmary. At Jervaulx the subvault of the monks' reredorter was the infirmary hall, and generally it was used for the infirmary of the novices. In Benedictine Westminster and Durham the reredorter directly adjoined the infirmary.

A monastic infirmary was not only a hospital for the sick but a great establishment for housing the infirm and aged. Where the infirmary is traceable in large Benedictine houses it is in the form of a great hall with one or two aisles, and had a chapel with aisles and a chancel to the east, generally in line with the hall but sometimes at right angles thereto.

¹ *Book of Manors*, 264.

The narrowness of the site at Worcester would prevent the erection of an infirmary of this plan, and Durham with a similarly contracted area has no remains nor is there a description of this building in the Rites.

The two stories beneath the reredorter at Worcester were without doubt part of the infirmary, and a two-storied building for this purpose is not unknown. It occurred both at Furness and Jervaulx in the thirteenth century, but at the former it was afterwards made into the abbot's house, and at the latter it remained till the suppression. There was also a two-storied infirmary at St. Agatha's, near Richmond, Yorks. In the ordinary type of infirmary the hall was both hall and sleeping-place, but in the two-storied examples the hall seems to have been above and the sleeping-place below. So that in comparing the area of the Worcester infirmary with others the two stories must be calculated as one, when it will be seen to be about the same size as those at Ely and St. Austin's, Canterbury. Besides this two-storied building, there was a chapel, the infirmarer's lodging and checker, and the barbery, which were apparently on the north side of the reredorter. In addition there must have been an infirmary kitchen, as the convent kitchen was too far away to serve the double purpose, as it probably did at Durham, and this would be to the south of the reredorter.

Before describing the remaining parts of the building a few facts connected with its history may be mentioned:

In 1287 'Decimo octavo kal. Octobris per periculosum ignem amota fuit camera juxta capellam infirmariae; quam qui iterum reaedificat, hoc eveniat ei quod reaedificanti Jericho legitur Josue versus finem imprecatum'.¹

Then in 1379 William Power the cellarer 'domum rasture in Infirmaria edificavit'.²

In the statutes for the refounding of the cathedral by Henry VIII the infirmarer's lodging was allotted to the prebend of the fifth stall, and that of the master of the chapel with the sites of the infirmary and infirmary chapel, was to be divided between the prebends of the eighth and ninth stalls.³

In 1617 the houses of the fifth and eighth prebends fell down, and in the year following they were 'to be built again as the church shall be able to bear the charge in the dormitory or the places adjoining thereat'. 'The said houses were to be built with a hall, parlour, kytshon and a buttery with fower rooms over the same.'⁴

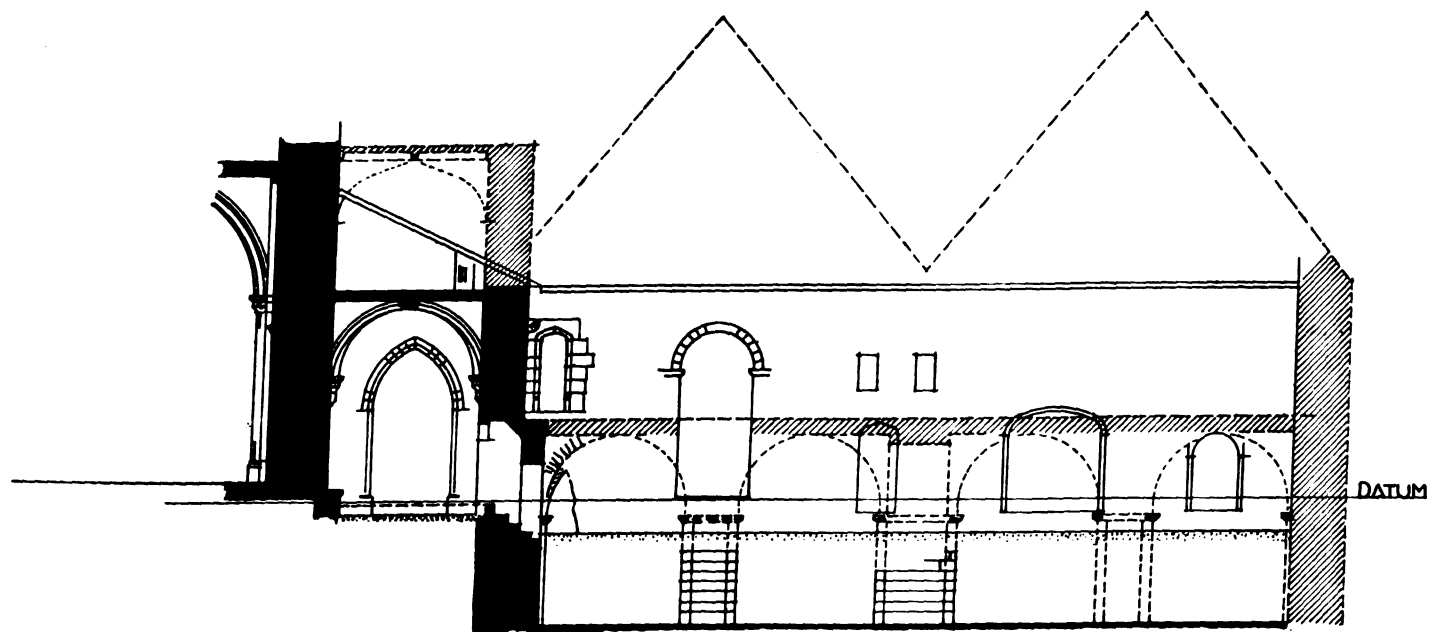
In 1671 the chapter ordered 'That the vault under the late infirmary be filled up or otherwise secured in such manner as workmen upon a due consideration of the matter shall advise, provided that if Dr. Reynolds or Dr. Jephcot,

¹ *Annales de Wigornia*, 494.

² *Edificiorum Chronologia*.

³ Valentine Green, *History and Antiquities of Worcester* (1796), i, 131. Unfortunately it is not possible at the present time to refer to the original document.

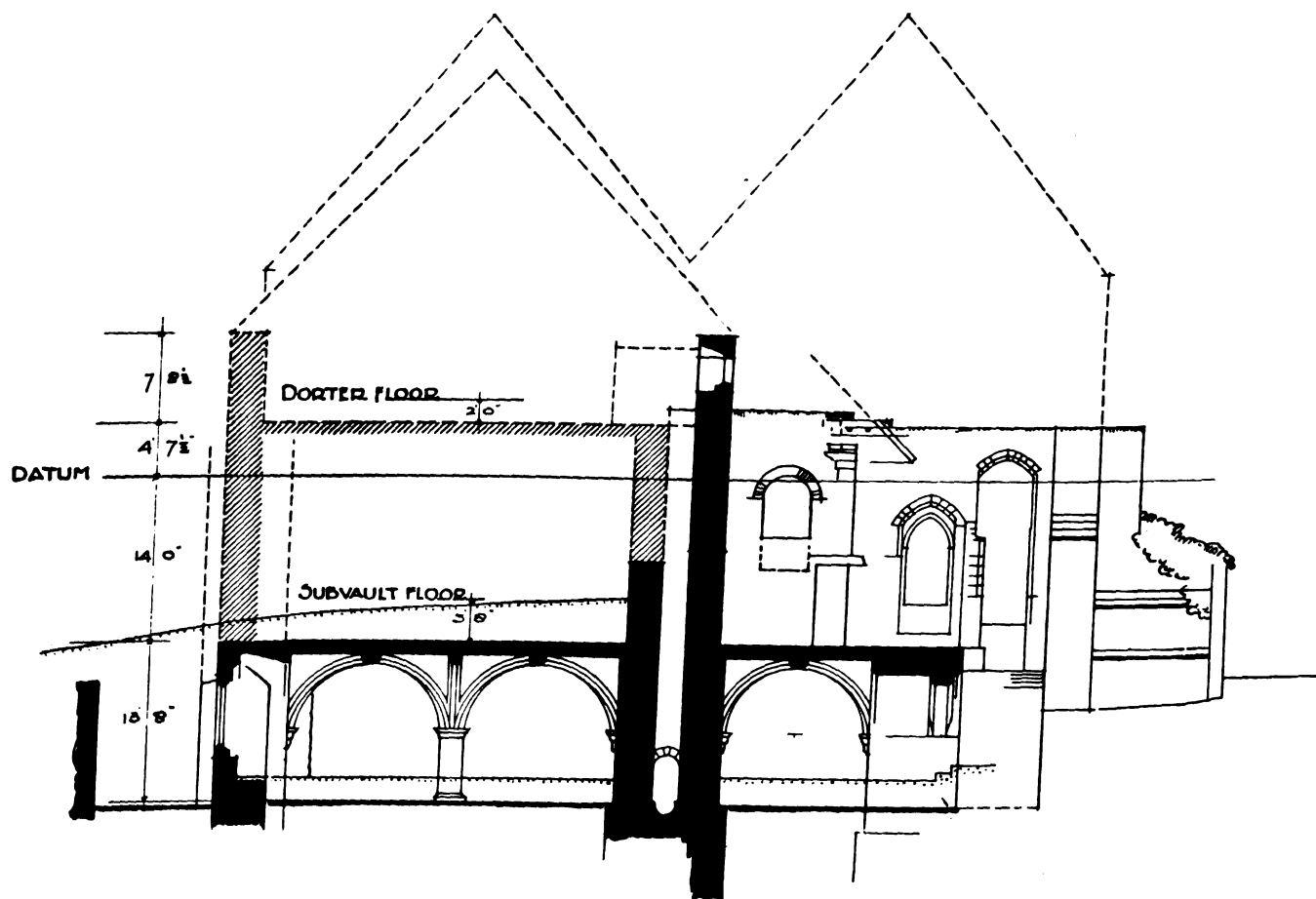
⁴ Cathedral Library, A. lxxiv, 21.



SECTION OF DORTER, LOOKING EAST.

WORCESTER PRIORY.

DORTER RANGE, &c.



SECTION OF RERE-DORTER, LOOKING EAST.

0 10 20 30 40 50 FEET.

the present incumbents of the fifth and eighth prebends, shall think any part of the same vault may be useful to their houses then such part shall be left and appropriated thereto for their respective service'.¹

Neither of these dignitaries seems to have required any part of it, but a portion of the northern end was appropriated to the house of the ninth stall.

The house of the fifth prebend seems to have continued near its old site northward of the dorter at the west end of the church. In the eighteenth century it is shown as a large house with a two-storied bowed end towards the river.² It was destroyed in 1851.³

The house of the eighth prebend was not an allocation of an existing building, but was apparently new built at the suppression on the north side of the infirmary. In 1649 it was occupied by Dame Elianor Buck and

'consisteth of A Laby roome or Entry, A Parler part Wainscote cont. in breadth 17 foote and in Length 20 foote, A Dining roome over it of the same bignesse Wainscote, A Kitchen, A pantry, A Celler under the Infirmary cont. 28 foote in breadth & 51 foote in length, Six Little Chambers, Alsoe A little Celler with 2 roomes over it, Likewise at the end of the infirmary A Wast roome or passage hanging over the River of Seaverne cont. Westward from the Said Infirmary in breadth 12 foote and in Length 26 foote within the Walls.'⁴

In 1798 it was a picturesque house, partly timber, three stories high, and had a wing containing two rooms over the north-west corner of the reredorter.⁵ It was destroyed in 1843.³

The house of the ninth prebend was in 1649 occupied by Mary Bellers and was 'part Stone part Tymber',

'and the same consisteth of A Laby roome or Walke cont. in breadth 9 foote and in Length 40 foote, A Kitchin, a little Can roome adjoyning, A Little Larder, A Celler under the Kitchen and vaults under the Rest of the Howse for Wood and Coal.

A Dining Chamber cont. in breadth 15 foote and in Length 26 foote, A chamber taken out of the Dormitory (as therein is expressed) cont. in breadth 11 foote 2 inches and in Length 15 foote 2 inches, A little Studdy by it, Six other Little roomes or Chambers with A Closett, Also at the end of A Roome called the Infirmary there are 2 upper chambers or Roomes being part of the Infirmary and a Garrett over them with some other Small Cells there. All which buildings Doe stand upon the banck of the River of Seavern and many of them Doe Hang exceedingly weakly over the same River being Somewhat dangerous to Live in, There is One passage to this House through the Darke Alley and another through the garden on the South.⁵

In 1795 it still was a picturesque group with a small oriel window over the river and of three stories.² This was followed by a large Georgian house in

¹ Cathedral Library, A. lxxiv, 107.

² Valentine Green, *History and Antiquities of Worcester* (1796), ii, 19.

³ Professor Willis, *Archaeological Journal*, xx, 257.

⁴ *Book of Manors*, 262.

⁵ *Ibid.*, 259.

red brick of three stories with sash windows. This was standing in 1860 and is described by Professor Willis:

The whole house, above its Norman vaulting, is of comparatively modern construction in walls, floors, and staircases, with the exception of its back or north wall, which rises to its roof, and is an ancient wall of red sandstone. The turret staircase projects outwards from that wall and reaches the roof; it is now in the form of a quadrant and is plastered outside, but Mr. Perkins informs me that it is really of stone.

This ancient wall retains on the east side of the turret, close under the roof a plain Norman arched window walled up; and on the west side the traces of a pair of arches, also walled up and partly covered by a huge brick chimney-stack built against the ancient wall.¹

This house was pulled down in 1874, but certain ancient portions were left standing.

The existing part of the reredorter and infirmary may now be described in detail. The ground story consists of two parallel subvaults; the northern was apparently 66 ft. long by $28\frac{1}{2}$ ft. wide and the southern $67\frac{1}{2}$ ft. long by 13 ft. wide at the west end and 12 ft. at the east. The two chambers are separated by a wall 9 ft. in thickness, and their floor was $17\frac{1}{4}$ ft. below that of the dorter subvault.

The northern subvault, save for the two western bays, appears to remain complete, though most of it is filled with rubbish in consequence of the chapter order of 1671. It is five bays in length by two in width, having round columns down the middle with moulded capitals. The vaulting has semi-octagonal cross and diagonal ribs, and rests on the walls on carved and moulded corbels. One of the bays of the north wall must have been occupied by the entrance doorway, but in each of the three eastern bays are windows. These consist of a pair of square-headed loops having pointed heads and wide splays internally, covered by an arch projecting 21 inches from the wall. These recesses are similar to the bed recesses in the monks' infirmary at Furness and that of the lay brothers at Fountains. There were probably no openings in the west end, in order not to weaken the defences towards the river, but this wall has been refaced externally.

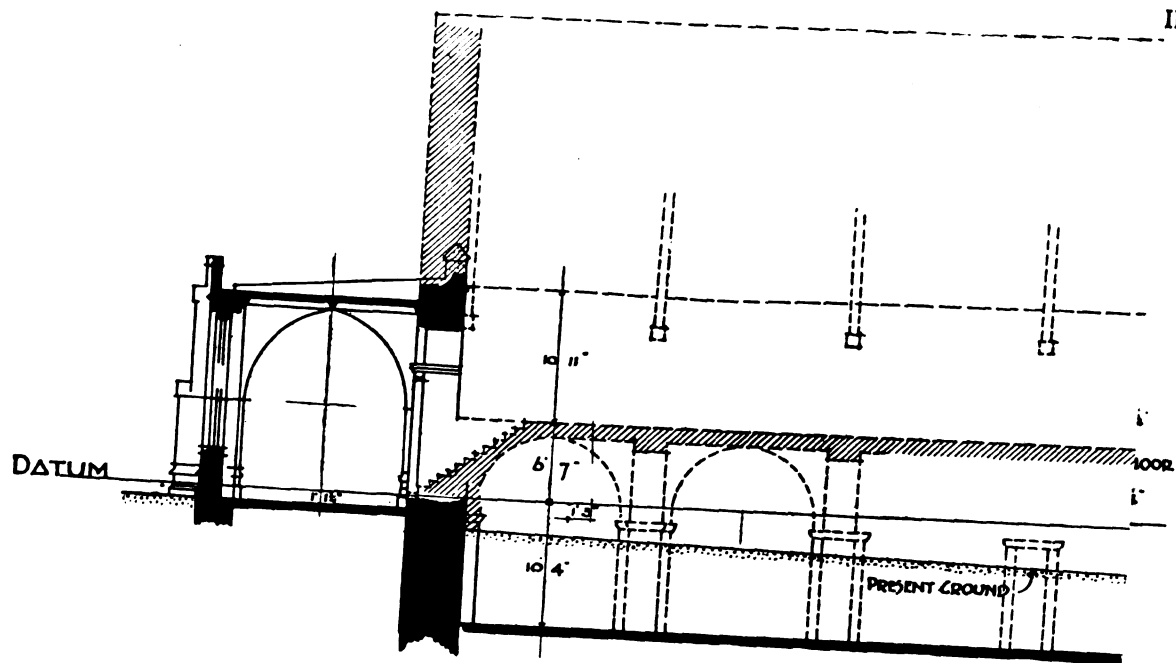
On the north side was a sunk area about 10 ft. wide to give light to the subvault, but it was never open to the river; the existing wall at the west end has a chamfered plinth, and dates from the twelfth century.

The north wall of the subvault is faced externally with fine jointed ashlar; there was a pilaster buttress at the north-east angle and presumably one dividing each bay.

In the first bay of the south wall is an opening $2\frac{1}{4}$ ft. wide, of which the east jamb is original, to a wall chamber $8\frac{1}{4}$ ft. long by 5 ft. wide.² This is covered by a semicircular barrel vault and was probably merely constructional.

¹ Professor Willis, *Archaeological Journal*, xx, 302.

² There is now an opening $2\frac{3}{4}$ ft. wide cut through into the southern chamber.

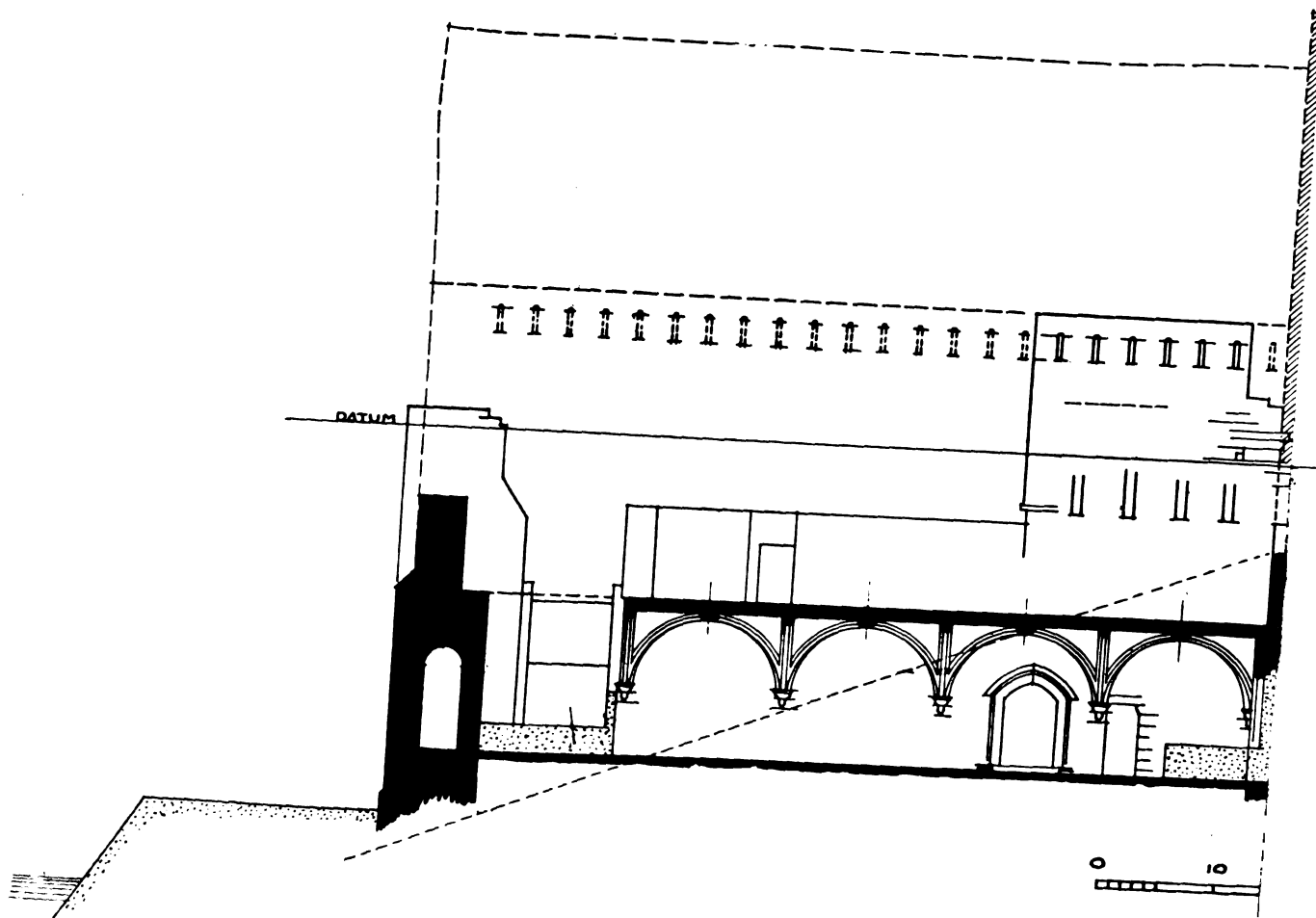


SECTION OF DORTER & RERE-DOI

WORCESTER CATHEDRAL PRIOR
DORTER RANGE, &c.

LOW-PATH

AVERAGE WATER LEVEL



In the next bay are the wide splays and deep segmental rear-arch of an inserted doorway from the southern room.

The east wall is obviously earlier than the infirmary, being that of the dorter built at least seventy years previously. It is faced with deep and shallow courses like the rest of the dorter range and has been much injured by damp. The tothing of the original north wall of the reredorter subvault clearly shows to the southward of the present north wall.

The southern subvault, though approximately of the same length as the northern, is only one bay in width and has a south wall no less than $7\frac{3}{4}$ ft. in thickness. This is pierced in each bay with a wide semicircular arch having a double chamfered order just within the outside face. These arches were originally without any windows, save perhaps in the westernmost bay, and the subvault seems to have been used in the first place for the infirmary cloister.

At the east end is a small fourteenth-century doorway, now blocked, the use of which cannot be ascertained without research. In the second bay on the north side is the front of the doorway communicating with the other subvault. It is of two members with a pointed segmental head, and was inserted under the drain of the reredorter.

Apparently in the fourteenth century the open arches were filled with wide windows, of which the supporting walls and parts of the sills have recently been found.

In 1912 part of the vaulting of the third and fourth bays collapsed owing to the injurious growth of ivy, and it is gratifying to state that this destruction was immediately repaired by the dean and chapter at considerable expense.

The westernmost bay has little ancient work visible, and has been mostly cased with brickwork. In the thickness of the west wall is an original chamber $5\frac{1}{2}$ ft. long by $3\frac{1}{4}$ ft. wide with a barrel vault which is obviously a wardrobe. This westernmost bay was probably the monastic prison, and it occupies precisely the same position as that at Durham, where 'was a stronge presonne called y^e lynghouse y^e which was ordeyned for all such as weare greate offenders . . . without any company, except y^e master of y^e fermery who did let downe there meate thorowgh a trap Dour in a great corde'.¹

Over the northern subvault was a high chamber of which little remains, though before 1843, when the house of the eighth prebend was pulled down, its north wall was standing.

This chamber was evidently 'the dark room called the infirmary', and is thus described by Green:

Two lofty walls of this building yet remain, and constitute, one of them the southern side of the eighth prebendal house, and the other the north side of the ninth

¹ *Rites of Durham*, 89.
p d

prebendal house. The space now uncovered between these walls was anciently a public room, as appears from the stateliness of the windows, whose arches, still preserved in the north wall, were elaborately wrought. Either the hall or the chapel of the infirmary must have been on this lower floor; and in the story above were the lodgings of the patients.¹

The floor above was certainly not the lodgings of the patients, but the reredorter of the monks, 12 in. below the dorter.

Of the south wall a length of 21 ft. remains to its full height and clearly shows the arrangement of the building. Over the 9-ft. wall separating the north and south portions of the subvault were the outer wall of the reredorter, 3 ft. thick, the space for the drain, 2 ft. 2 in. wide, and the inner wall of the drain pit, 2½ ft. thick. Over the drain were arranged the privies, 3 ft. wide with seats 18 in. high, and divided by wooden partitions, the heads of which were 6½ ft. above the floor.

These divisions are all clearly shown by holes in the walls for the respective timbers. Each privy had a small round-headed window, unglazed, for light and ventilation, and six of these yet remain, but there were originally twenty-three divisions.

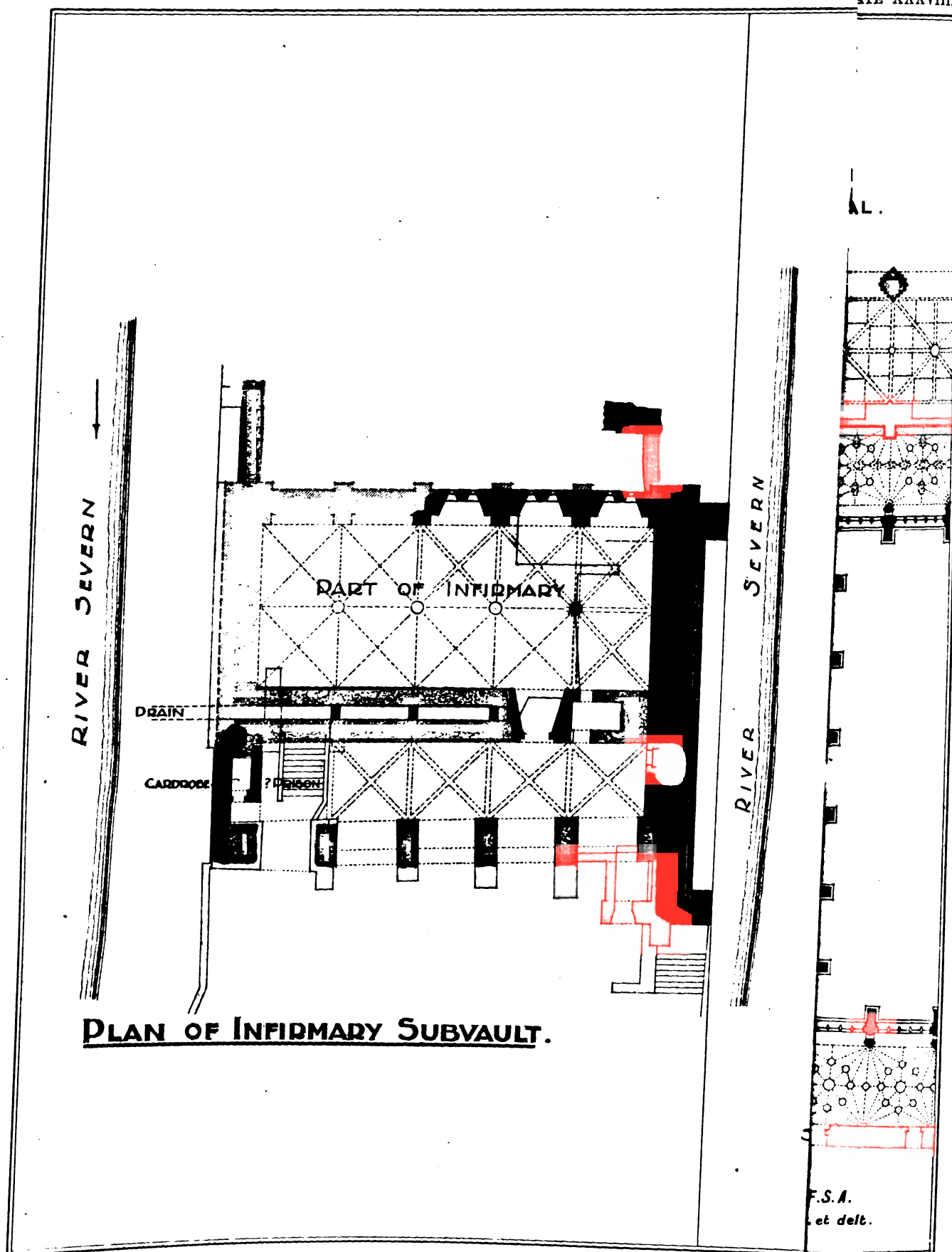
The great peculiarity of this building at Worcester is the drain, which is on a quick run, of 21°, from 3 ft. above the floor of the dorter subvault down to the river. The drain has a semicircular channel of stone at the bottom, and is crossed opposite each abutment of the subvaults by inserted stone buttresses 17 in. thick continued up to the reredorter floor and carried on little semicircular arches. This tying together of the outer and inner walls of the pit of the drain is unusual, and doubtless indicates that the first-floor chamber on the north side was vaulted. As the drain begins above the floor of the dorter subvault it precludes any possibility of an underground supply of water, and must have been entirely dependent for flushing upon the storm-water off the dorter and perhaps the reredorter roofs.

It may be interesting to compare a few of the larger of these buildings at other places. At Christ Church, Canterbury, the reredorter, called there 'the third dorter', was 140 ft. long and had originally a range of fifty-five privies over the drain, each division being carried by a cross-arch in stone. There were no separate windows to each division and there was no subvault, the space up to the floor level being filled in solid.²

At the Cluniac house of Lewes the reredorter is 157 ft. long and had no less than sixty-one divisions, which were also carried on cross-arches of masonry

¹ Valentine Green, *The History of Worcester*, i, 88.

² Professor Willis, *History of Christ's Church, Canterbury* (1869), 82.



PLAN OF INFIRMARY SUBVAULT.

over the drain. There are no separate windows to each closet, and the subvault, which is very narrow, was mere cellarage.¹

At Westminster the reredorter 'at the south end of the dorter was a large room 20 ft. wide and 70 ft. or more long. It had closets opening from it along each side and as it appears across the east end.'²

At Durham the reredorter is 63 ft. by 25 ft., in a position exactly similar to that at Worcester. It was

a faire large house and a most decent place adioyning to the west syd of the said Dortre, towardes y^e water for y^e mounckes and novices to resort vnto called the privies which was maide with two greate pillers of stone that did beare vp the whole floore thereof, and every seate and partition was of wainscott close of either syde verie decent so that one of them could not see one another, when they weare in that place, there was as many seates of privies on either syde as there is litle wyndowes in y^e wall which wyndowes was to gyve leighte to every one of the saide seates.³

The chamber over the southern subvault was obviously unconnected with the infirmary owing to the pit of the reredorter intervening, but has a fourteenth-century doorway from the dorter subvault. Originally it was little more than a space under the lean-to roof covering the open subvault, but was raised a story probably in the thirteenth century. The chase for its pitched roof remains at the east end. At the north end of the east wall is a four-centred arched doorway, now blocked, which may have been connected by a vice with that in the subvault below.

In the fourteenth century the building was raised another story. The notches for its inserted beams show in the wall of the reredorter; they were 10 in. thick and 4 ft. apart. To gain access to this added floor a square staircase was erected in the angle at the end of the dorter; the tall arch already described in the dorter subvault spanned the ascending steps. The lower part of the staircase was to take descending steps to the open subvault.

Before the suppression this building was allotted to the master of the chapel (*magister capellae*), who besides having the care of the Lady chapel in the cathedral was also master of the song school, as is shown by an inventory of stuff belonging to the priory⁴ in which under 'Maist^r of the Chapell' is:

Item, a surples for the maister of the chylderne, and vj surplesses ffor the chylderne, a masse bocke of — with pryckesonge, wheryn ys v parts, and iiij parts, iiij pryckesonge masse bockes of pawper, ij hother bockes . . . on with antems, and salmes yn hym, iiij lyttle pryckesonge bock's of masses, v masse bockes of v parts, v bockes with salve festa dies, and scrolls belongynge to the ij pawper bockes yn them be the v

¹ W. H. St. John Hope, *Archaeological Journal*, xli, 34.

² J. T. Micklethwaite, *Archaeological Journal*, xxxiii, 31.

³ *Rites of Durham*, 85.

⁴ Harl. 604.

parts of other songs: a . . . note bocke burdyde, a parchment bocke of salmes burdyde, ij masses of v parts yn parchment skrowlls, a pawper bocke of iiij parts, a pawper bocke with the vitatoris benedict' te deum yn pryckynge, ther be iij or iiij antems in scrowes. Item, a lampe of brasse yn owr lady chapell hangynge, iij coffers to put yn the stufe with lockes and keys. In the chambre ys a table burde with ij trestylls, a benche made fast, ij formes, a coffer.

From the connexion between the song school and the Lady chapel it would appear that the original position of that building was, as at Durham, adjoining the eastern part of the church. A description of the song school there, where there was the same number of children as at Worcester, may appropriately close this paper:

There was in y^e Centorie garth in vnder y^e south end of y^e church a song schoole buylded, for to teach vj children for to learne to singe for y^e mayntenance of gods Divine service in y^e abbey church, which children had there meat and there drinke of y^e house coste amonge the children of thalmarie and y^e said schoole was verie fynely bourded within Rownd about a mannes hight about y^e waules and a long deske did reache frome one end of y^e scoole to thother to laie there bookes upon, and all the floure Bourded in vnder foote for warmnes, and long formes sett fast in y^e ground for y^e children to sitt on. And y^e place where y^e master did sitt and teach was all close bordede both behinde and of either syde for warmnes, And y^e said master was bownd to plaie on y^e orgains every principall daie, when y^e mounckes did sing ther high messe and likewise at evinsong, but y^e mounckes when thei weare at there mattens and service at mydnighte, thene one of y^e said mounckes did plaie on the orgains themeselves and no other. Also y^e master of y^e said Childrin had his chamber nyghe unto y^e said schoole a litle distant from it where he did live, having his meite and drinke in y^e priors hall, emonges y^e priors gentlemen and all his other necessities found of y^e prior and of y^e house coste besydes, vntill such tyme as y^e house was supprest, and shortlie after because ther was no techinge in that scoule any longer, but tawght in an other place or scoule appointed for that purpose, so that y^e foresaid scoole in y^e Centorie garth is clene gone to decaie and pulled downe that one cannot tell almost in what place yt did stand.¹

In conclusion, the writer wishes to tender his thanks to the Dean and Canons for permission to make the required excavations, and for access to all parts of the buildings in their charge; to Canon and Mrs. Wilson for allowing excavations to be made in their garden, for much sympathetic help and kind hospitality at all times; and to Mr. C. B. Shuttleworth, the present master of the song school, for much help in taking measurements and levels.

¹ *Rites of Durham*, 62.

INDEX TO VOLUME LXVII

A

- Acton (Middx.), flint implements from, 37.
 Adze or axe, iron, socketed, Hallstatt (Austria), 149, 150.
 Allen, T., on crypt near Merchant Taylors' Hall, London, 5.
 Allnutt, C. E., collection of flint implements, 36.
 Amber beads and rings, Hallstatt (Austria), 157.
 Amphorae: neolithic, from Hal-Tarxien (Malta), 144; Roman, Gaddesden Row (Herts.), 52.
 Andrews, Dr. C., 75, 88; determination of animal species from remains found at La Cotte de St. Brelade, Jersey, 84, 86 *n.*
 Animal remains: Hallstatt (Austria), 160; Hal-Tarxien (Malta), 133, 137; La Cotte de St. Brelade (Jersey), 78, 83-6, 113, 114, 116-18; Mixies Hill, Luton (Beds.), 67.
 Anklets, penannular, bronze, Hallstatt (Austria), 153.
 Antlers, Mixies Hill, Luton (Beds.), 67.
 Apothecaries' Company, London, excavation of site of premises of, 13, 14.
 Armlets, hollow, bronze, Hallstatt (Austria), 152, 153; penannular, bronze, Hallstatt, 152.
 Arms and armour: *see* Adze, Axe-blade, Celts, Daggers, Flint implements, Knives, Neolithic celt, Palaeolithic implements, Palstaves, Spear-head, Stone implements, Swords.
 Aurignac Period, implements of the, 28, 33, 42 *n.*, 44, 107, 116, 118.
 Austin Friars, convent of, London, 7.
 Avebury, Baron (Sir John Lubbock), collection of antiquities from the Early Iron Age cemetery of Hallstatt (Austria), 145-66; presented to the British Museum by his son, the second Baron Avebury, 145.
 Awls: bone, from La Cotte de St. Brelade (Jersey), 87, 88; bronze, Hal-Tarxien (Malta), 141.
 Axe-blade, iron, Hallstatt (Austria), 149, 150.
 Aystwyk, John, 3.

B

- Baildon, W. Paley: The Trousseaux of Princess Philippa, wife of Eric, king of Denmark, Norway, and Sweden, 163-88.

- Balfour, Henry, 77; collection of palaeolithic implements, 103.
 Band, bronze, ornamented, Hallstatt (Austria), 151.
 Barbers' Company, London, hall of, 7.
 Barnes, Joshua, on an entertainment of foreign kings in London (1363-4), 119, 120, 126.
 Barnes, Prof. Schwartz, 45 *n.*
 Barreau, A. H., plan of excavations at La Cotte de St. Brelade (Jersey), and drawings of figured specimens, 75, 81, 87, 88 *n.*, 114 *n.*
 Bars, bronze, Hallstatt (Austria), 154, 156.
 Bate, Miss D. M. A., determination of species of birds from remains found at La Cotte de St. Brelade (Jersey), 84.
 Bavaria, duke of, banquet to (1363-4), 119.
 Bayly, Miss, excavation work in Jersey, 75.
 Beads: amber, Hallstatt (Austria), 157; black and white, Hal-Tarxien (Malta), 135, 137; bone, Hallstatt, 157; glass, Hallstatt, 157, 158; shell, Hallstatt, 157.
 Beakers, Bronze Age, from Hal-Tarxien (Malta), 139.
 Bedfordshire: *see* Caddington, Kensworth, Mixies Hill, Ramridge End, Round Green.
 Bedmond, Abbots Langley (Herts.), palaeolithic implements found at, 50.
 Belts, bronze, with bosses, Hallstatt (Austria), 151.
 Benedictine houses, monastic arrangements in, 189, 196, 197, 198.
 Bentley, Samuel, on an entertainment of foreign kings in London (1363-4), 120.
 Bertrand, Alexandre, on objects from Hallstatt (Austria), 160.
 Besant, Sir Walter, on Westminster belfry, 16.
 Birds, figurines of, Hal-Tarxien (Malta), 137.
 Bishop, A. H., flint implements found by, 47.
 Bohun, Humphrey de, earl of Hereford and Essex, founder of convent of Austin Friars in London, 7.
 Bohun, Mary de, wife of Henry IV, 163, 164.
 Bolognese Period: chronology of, 159; types of, 158, 161.
 Bone objects: awls, La Cotte de St. Brelade (Jersey), 87, 88; bead, Hallstatt (Austria), 157; borers and burnishers, Hal-Tarxien (Malta), 143; cross-

- bars of triple row of beads, ornamented, Hallstatt (Austria), 157; cylinders made from legs of birds, Hal-Tarxien (Malta), 138; handles of awls, Hal-Tarxien, 141; penannular object formed of vertebra, Hallstatt (Austria), 157.
- Bosses, bronze, Hallstatt (Austria), 151, 156.
- Bourlon, Captain, flint implements found by, 44.
- Bowet, Henry, bishop of Bath and Wells, escort of Queen Philippa to Denmark on her marriage, 170, 172, 185; livery of, 170, 176; payment to, 172, 185.
- Bowls: Bronze Age, from Hal-Tarxien (Malta), 133, 139; neolithic, 144.
- Bracelets, grooved, Hallstatt (Austria), 160.
- Brakspear, Harold: On the Dorter Range at Worcester Priory, 189-204.
- British Association, excavations by, at La Cotte de St. Brelade (Jersey), 76, 77, 79.
- British Museum: collection of antiquities from the Early Iron Age cemetery of Hallstatt (Austria), 145; flint implements, 28, 30, 33, 45, 47; flint implements from La Cotte de St. Brelade (Jersey), 88*n.*, 93, 99, 107; palaeolithic implements, 53, 70.
- Brodie, P. H., excavation work in Jersey, 75, 86*n.*
- Bronze Age: burial-place, Hal-Tarxien (Malta), 135, 136; chronology, 158, 159; grave-furniture, Hal-Tarxien, 135, 136; iron swords, Hallstatt (Austria), 147, 148; pottery, Hal-Tarxien, 139.
- Bronze objects: anklets, penannular, Hallstatt (Austria), 153; armlets, hollow and penannular, Hallstatt, 152, 153; awls, Hal-Tarxien (Malta), 141; band, ornamented, Hallstatt, 151; bars, Hallstatt, 154, 156; belts, with bosses, Hallstatt, 151; bosses, Hallstatt, 151, 156; brooches, Hallstatt, 153-5; buckets, Certosa (Bologna), 161; Hallstatt, 146, 158, 160, 161; Klein-Glein (Styria), 161; Klein-Zöllnig (Silesia), 161; Monceau-Laurent (Côte-d'Or, France), 160, 161; Slupce, near Kalisz (Poland), 161; Tannheim (Leutkirch, Württemberg), 161; Watsch (Carniola), 161; Weybridge (Surrey), 161; buttons, Hallstatt, 156; cauldron, Hallstatt, 160; chisels, Hal-Tarxien, 141; circular cover of a vase, Hallstatt, 151, 156; dish, Hallstatt, 160; earrings, Hallstatt, 154; embossed plate, Hallstatt, 156; girdle-hooks, Hallstatt, 153; handle and chape of dagger, Hallstatt, 146-8; implements, Hal-Tarxien, 135; nails, Hallstatt, 156; pendants, Hallstatt, 150, 151; pins, Hallstatt, 154-6, 160; plates, Hallstatt, 150, 156, 157; ring, Hallstatt, 154, 156, 158, 160; sphere formed of two basins, Hallstatt, 150; spiral tube of flat wire, Hallstatt, 156; studs, Hallstatt, 156; sword, Hallstatt, 160.
- Brooches, bronze, Hallstatt (Austria), 153-5.
- Broughton, near Banbury (Oxon.), flint implements from, 42*n.*
- Brown, Allen, classification of flint implements, 36.
- Buckets, bronze: Certosa (Bologna), 161; Hallstatt (Austria), 146, 158, 160, 161; Klein-Glein (Styria), 161; Klein-Zöllnig (Silesia), 161; Monceau-Laurent (Côte-d'Or, France), 160, 161; Slupce, near Kalisz (Poland), 161; Tannheim (Leutkirch, Württemberg), 161; Watsch (Carniola), 161; Weybridge (Surrey), 161.
- Buckinghamshire: *see* Iver, Taplow.
- Bukton, Sir John de, livery of, 177; payment to, for services to Queen Philippa of Denmark, 172, 185.
- Bukton, Sir Piers de, steward of the household to Queen Philippa of Denmark, livery of, 177; payment to, 172, 185.
- Bulls, figures of, Hal-Tarxien (Malta), 132, 142.
- Burials: Certosa (Bologna), 161; Hal-Tarxien (Malta), 135, 136.
- Buttons, bronze, Hallstatt (Austria), 156.

C

- Caddington (Beds. and Herts.), palaeolithic floor near, 49, 55, 57, 62, 63, 66.
- Calixtus III, pope, bull of, 4.
- Canterbury (Kent): Christ Church Priory, monastic arrangements at, 189, 190*n.*, 197, 202.
- Carving: *see* Sculptures.
- Castle Acre Priory (Norfolk), monastic arrangements at, 197.
- Cater, W. A., on excavations on the site of the conventual buildings, Austin Friars, London, 9, 10.
- Cauldron, bronze, Hallstatt (Austria), 160.
- Cave Period, implements of the, 27, 28, 32-4, 45, 48.
- Celts: iron, Hallstatt (Austria), 149, 150; neolithic, *see* Neolithic celt; palaeolithic, Gaddesden Row (Herts.), 52.
- Certosa (Bologna): bronze buckets from cemetery at, 161; brooch, type of, 154, 155.
- Chastellayn, Sir Richard, 123, 124.
- Chirchman (or Churchman), John, deed of, 3.
- Chisels, Bronze Age, from Hal-Tarxien (Malta), 141.
- Christy Collection of flint implements, 30, 33.
- Chrutchoff, B. de, excavation work in Jersey, 75.
- Cinerary urns, Bronze Age, from Hal-Tarxien (Malta), 135-9.
- Cissbury (Sussex), flint implements from, 28, 43, 45-8.
- Cistercian abbeys, monastic arrangements in, 192, 197, 198.
- Clairvaux Abbey (France), monastic arrangements at, 192.

Clapham, A. W., 14.
 Clark, W. G., flint implement found by, 41.
 Clay objects: amphorae, Hal-Tarxien (Malta), 144;
 birds, beads, etc. from necklaces, Hal-Tarxien,
 137; bowl, Hal-Tarxien, 133; carved jars, Hal-
 Tarxien, 137, 139, 140, 144; coffin, Hallstatt
 (Austria), 161; disc on pair of legs, Hal-Tarxien,
 138; figurine, Hal-Tarxien, 143; figurines of
 birds, Hal-Tarxien, 137; pots, Hal-Tarxien, 137;
 reels, Hal-Tarxien, 143; statuettes, Hal-Tarxien,
 138, 142; vessels, Hal-Tarxien, 135, 136, 139,
 140.
 Cleeve Abbey (Som.), monastic arrangements at, 192.
 Clifford, Henry, 121.
 Clifford, Richard, 'wardrober' to Queen Philippa of
 Denmark, documents concerning, 185, 186;
 livery of, 170, 177, 183; payments to, 172, 185,
 186.
 Clifford, Thomas de, eighth lord, 121.
 Clifford, Thomas, monk of Westminster, chronicle of,
 120, 121.
 Clode, C. M., on the hall of the Merchant Taylors
 (London), 2, 5 n.
 Cluniac priories, monastic arrangements in, 197, 202.
 Cockerell, S. P., sessions house at Westminster
 designed by, 16, 17.
 Coffin, clay, Hallstatt (Austria), 161.
 Coins: Roman, Gaddesden Row (Herts.), 52; Round
 Green, Luton (Beds.), 64.
 Colonia, John de, 6.
 Coltart, Captain A. H. and Mrs., excavation work in
 Jersey, 75.
 Comont, Prof. V., on Le Mousterian type of imple-
 ments, 30, 31, 34, 44, 88, 91, 103.
 Conway, Prof. R. S., on votive offerings, 151.
 Copper dagger, Hal-Tarxien (Malta), 135.
 Copton-in-Preston, Faversham (Kent), flint imple-
 ment from, 36, 37.
 Crayford (Kent), flint implement from Wansunt pit,
 32, 33.
 Cremated burial, Bronze Age, Hal-Tarxien (Malta),
 135, 136.
 Crepin, Edmund de, 3, 6.
 Cups, Bronze Age, from Hal-Tarxien (Malta), 140.
 Curzon, Sir Nathaniel, 25.
 Cyprus, king of: *see* Peter de Lusignan.

D

Daggers: copper, Hal-Tarxien (Malta), 135, 141;
 iron, Hallstatt (Austria), 146-8.
 Daghorn, Ernest, excavation work in Jersey, 78,
 82 n., 83.
 Dale, William, collection of flint implements, 36, 47.

David II, king of Scotland, banquet in London to,
 119, 123-6.
 Davies, Hugh, 45 n.
 Déchelette, Joseph, on chronology and types of the
 Hallstatt Period, 146, 159.
 Denmark, kings of: *see* Eric, Waldemar IV.
 Discs: clay, Hal-Tarxien (Malta), 138; flat, rough
 reddish ware, Hallstatt (Austria), 157.
 Dish, bronze, Hallstatt (Austria), 160.
 Documents: Grey Friars' Register, 18, 22; ward-
 robe accounts of the trousseaux of Princess
 Philippa, wife of Eric, king of Denmark, 174-88.
 Doll, Fitzroy, 26.
 Dominican Priory, Blackfriars: *see under* London,
 Medieval remains in.
 Dovercourt (Essex), flint implements from, 45.
 Drift Period type of implements, 32, 34, 41, 42,
 46, 47.
 Dun, John, valet-tailor to Philippa, queen of Denmark,
 materials used by, 164 ff., 174 ff.
 Dunbridge (Hants.), flint implements from, 36, 37.
 Dunlop, Dr. A., 112 n.
 Durham Priory (Durham), monastic arrangements at,
 192, 196-8, 201, 203; song school, 204.
 Durham: *see* Durham Priory.
 Dutch Church, Austin Friars: *see under* London.

E

Early Danish Stone Age, 27.
 Early Iron Age: collection of antiquities from the
 cemetery of Hallstatt (Austria), 145-66.
 Earrings, bronze, Hallstatt (Austria), 154.
 East Dean, near Eastbourne (Sussex), flint imple-
 ment from, 36.
 Edward III: clock-tower at Westminster built for,
 15; entertains foreign kings in London, 119,
 123-6.
 Edward VI, grant of the nave of the church of the
 Austin Friars to the Dutch nation in London, 7.
 Edward the Black Prince, 119, 120, 125.
 Elvedon (Suffolk), flint implements from, 37.
 Eric, king of Denmark, Norway, and Sweden: arms
 of, 172; marriage of, 163, 164.
 Essex: *see* Dovercourt, Tilbury.
 Este Period: chronology of, 158, 159; inscribed
 tablets and votive nails of, 151.
 Estney, John, abbot of Westminster, 121.
 Etruscan Period: chronology of, 159; types of, 158,
 161.
 Evans, Sir Arthur, 117 n.
 Evans, Sir John, 32, 53, 67, 145 n., 162; palaeolithic
 implements discovered by, 50, 52.

F

- Feast of the Five Kings in London (1363-4), 119-26.
 Finger-ring, bronze, Hallstatt (Austria), 160.
 Fisherton (Wilts.), flint implements from, 37.
 Flint implements: Acton (Middx.), 37; Broughton, near Banbury (Oxon.), 42 *n.*; Cissbury (Sussex), 28, 43, 45-8; Copton-in-Preston, Faversham (Kent), 36, 37; Crayford (Kent), 32, 33; Dovercourt (Essex), 45; Dunbridge (Hants), 36, 37; East Dean, near Eastbourne (Sussex), 36; Elvedon (Suffolk), 37; Fisherton (Wilts.), 37; Grime's Graves (Norfolk), 27-9, 35-47, 108; Hal-Tarxien (Malta), 133, 143; High Lodge, Mildenhall (Suffolk), 37, 45; Hitchin (Herts.), 31, 45; Ickleford (Herts.), 31, 32; Iver (Bucks.), 36; Ivry, near Paris, 47; La Cotte de St. Brelade (Jersey), 77-80, 85-118; Lee-on-Solent (Hants), 47; Le Moustier (Dordogne, France), 30, 31, 33, 34, 37, 38; Levallois-Perret, near Paris, 31; Liège (Belgium), 30, 31; Montières, near Amiens (France), 30, 33, 44; North Cray (Kent), 42, 43, 44; Northfleet (Kent), 44, 96, 97, 108; Rickmansworth (Herts.), 47; Round Green, Luton (Beds.), 67; St. Acheul, Amiens (France), 47; St. Walburge, Liège (Belgium), 34; Santon (Norfolk), 41; Santon Downham (Suffolk), 37; Southampton (Hants), 47, 48; Swanscombe (Kent), 107; Taplow (Bucks.), 37, 38, 39, 45; Thames at Tilbury (Essex), 34, 36; Thetford (Norfolk), 37; Wansunt, Crayford (Kent), 32, 33; Warren Hill (Suffolk), 46; Weeting (Norfolk), 40, 43; West Drayton (Middx.), 37; West Tofts (Norfolk), 37; Yiewsley, near West Drayton (Middx.), 36, 37.
 Flint-mines: Cissbury (Sussex), 28, 29, 45-8; Grime's Graves (Norfolk), 28.
 Floor: Palaeolithic, near Caddington (Beds. and Herts.), 49-74; Roman, Threadneedle Street, London, 1.
 Fountains Abbey (Yorks.), monastic arrangements at, 197, 200.
 Fournivall, Thomas Nevill, Lord de, treasurer of England, document relating to, 168, 187.
 Fox, G. J. Buscall, palaeolithic collection, 47.
 France, king of: *see* John II.
 Franciscans, the, 18.
 Froissart, John, on a visit of foreign kings to London (1363-4), 124, 125, 126.
 Furness Abbey (Lancs.), monastic arrangements at, 197, 198, 200.
 G
- Gaddesden Row (Herts.), palaeolithic floor at, 49-62; brick-earth, 49, 52, 53, 55, 56; brickyard, 49, 51;

- contorted drift, 53, 54, 56; geology, 50, 52-6; palaeolithic implements, 52-62; pit, 49, 53, 56; plans of site, 50, 51; Roman remains, 52; sections showing palaeolithic deposits, 54.
 Gade (Herts.), valley of the, 49; palaeolithic implements from, 50; section of, 50, 51.
 Geology: Gaddesden Row (Herts.), 50, 52-6; La Cotte de St. Brelade (Jersey), 85, 100, 105, 111-18; Round Green, Luton (Beds.), 62-6.
 Girdle-hooks: bronze, Hallstatt (Austria), 153; iron portions of, Hallstatt, 153.
 Gisors, Sir John de, will of, 122.
 Glamorganshire: *see* Margam, Neath.
 Glass beads, Hallstatt (Austria), 157, 158.
 Gold object of unknown use, with two small rivets, Hallstatt (Austria), 160.
 Goldsmiths' Company, London, hall of, 7.
 Grave-furniture of Bronze Age burial, Hal-Tarxien (Malta), 135-7.
 Graver, the, Cave Period type of implement, 27.
 Green, Valentine, on Worcester Priory, 198, 199, 201, 202.
 Greenwell, Canon W., collection of flint implements, 28, 40.
 Grenier, Albert, on types of the Villanova Period, 158.
 Grey Friars of London, water-supply of, 18-26.
 Grime's Graves (Norfolk), flint implements from, 27-9, 35-47, 108.
 Grindstones, neolithic, Hal-Tarxien (Malta), 143.
 Grocers' Company, London, 6.
 Gruchy, G. F. B. de, excavation work in Jersey, 75, 77, 79 *n.*, 87 *n.*

H

- Hallstatt (Upper Austria), inventory and chronology of a collection of antiquities from the Early Iron Age cemetery at, 145-62; adze or axe, iron, socketed, 149, 150; anklets, penannular, bronze, 153; armlets: hollow, bronze, 152, 153; — penannular, bronze, 152; axe-blade, iron, 149, 150; band, bronze, 151; bars, bronze, 154, 156; beads: amber, 157; — bone, 157; — glass, 157, 158; — shell, 157; belts, bronze, with bosses, 151; bosses, bronze, 151, 156; bracelets, 160; brooches, bronze, 153-5; bucket (cist), bronze, ornamented, 146, 158, 160, 161; buttons, bronze, 156; cauldron, bronze, 160; celts, iron, 149, 150; chronology of the cemetery, 169; coffin, clay, 161; covers of vases, circular, of bronze, 151, 156; cross-bars of bone, ornamented, 157; daggers, iron, 146-8; disc, flat, of rough reddish ware, 157; dish, bronze, 160; earrings, bronze, 154; embossed plate of thin bronze, 156; finger-ring, bronze,

- 160; girdle-hooks, bronze, 153; — iron portions of, 153; gold-foil on swords, 147-9, 160; gold object of unknown use, 160; handle and chape of dagger, bronze, 146-8; ingot, iron, 153; knife, iron, crescent-shaped, 150; nail-pick, 154; nails, bronze, 156; palstaves, iron, 150; penannular bone object, 157; pendants, bronze, 150, 151; pins, bronze, 154-6, 160; plates, bronze, 150, 156, 157; pommel of sword, ivory, 148-50; pottery, 157, 160; rings: amber, 157; — bronze, 154, 156, 158, 160; spear-head, iron, 149, 150; spheres, bronze, 150, 154; spindle-whorl, grey ware, 157; spiral tube of flat wire, bronze, 156; studs, bronze, 156; swords, iron, 147, 148; — bronze, 160; toilet implements, 154; tweezers, 154; whetstone of grey slaty stone, 157.
- Hallstatt Period, chronology of the, 158-62.
- Hal-Saflieni (Malta), neolithic village, 127, 142, 143.
- Hal-Tarxien Neolithic Temple, Malta, 127-44; altars, 132-4, 142; altar-stone, 132, 133; amphorae, 144; animal remains, 133, 137; apses, 128-30, 132-4, 141; areas, 130, 133; awls, bronze, 141; beads, 135, 137; beakers, 139; birds, figurines of, 137; bone objects, 135, 137, 138, 141, 143; bowls, clay, 133, 139, 144; Bronze Age objects, 136-41; burial-place, 135, 136; chisels, 141; cinerary urns, 135-9; cistern, 134; clay objects, 133, 138-40, 143; conical stones used as objects of veneration, 142, 143; daggers, copper, 135, 141; description of the buildings, 130-4; discs, clay, 138; entrance, 133; excavations, 127 ff.; fish vertebrae, 137; flagstones, 130; flint implements, 133, 143; foot-stones, 133; goats, frieze of, 134; grave-furniture, 135-7; grindstones, 143; human remains, 135-7; jars, 137, 139, 140, 144; knife, flint, 133, 143; metallic objects, 141; miscellaneous objects, 143; models of megalithic buildings, 142; necklaces, 137; neolithic objects, 141-4; niches, 132-5; ornaments, personal, 135-7; passages, 132-4; paving, 129, 130, 133, 135; pendants, 137, 143; pig, figure of, 134; pillars, 130, 134, 142; plaques, silver, 141; pottery, 133-5, 137-40, 143, 144; ritual vessels, 136, 139, 140; rooms, 132-5, 141; sculptures, 133, 134, 137, 141, 142; site, 127-9, 134; sketch plan of the temple, 130, 131; slabs, stone, 130, 132-4, 141, 142; sow, figure of, 132, 142; spirals, ornamented, 133, 134, 141; statue, colossal stone, 133; statuettes, clay, 138, 142; steps, 130, 132, 134; stone blocks, 128-30, 133, 134, 141, 142; stone objects, 132, 133, 141-3; symbolical objects, 138, 142; troughs, stone, 133; use of temple by Bronze Age people, 142; vessels, clay, 133, 136, 139, 140; walls, 129, 130, 132-4, 136.
- Hammer-stones, La Cotte de St. Brelade (Jersey), 80, 109.
- Hampshire: *see* Dunbridge, Lee-on-Solent, Netley, Southampton.
- Hartley, Mr., notes on Aldgate crypt and pump, 12.
- Haydon, F. R., 123.
- Henry IV, arms of, 167, 172, 173, 185, 187, 188; marriage of, 163, 164; warrants and other documents by, 168, 185-7.
- Henry V, contract of marriage of, 163; foundation of Briggittine house of Syon (Middx.), 164.
- Heraldry: arms on hangings, liveries, and plate of Queen Philippa of Denmark, 167, 172, 173, 185, 187, 188. Arms of: Denmark, king of, 172; Gloucester, Humfrey, duke of, 172; Henry IV, 167, 172, 173, 185, 187, 188. Badge of Henry IV, 173.
- Hertfordshire conglomerate and quartzite, 52, 53, 55, 64, 66.
- Hertfordshire: *see* Bedmond, Caddington, Gaddesden Row, Hitchin, Ickleford, Leverstock Green, Markyate Street, Rickmansworth.
- High Lodge, Mildenhall (Suffolk), flint implements from, 37, 45.
- Hitchin (Herts.), flint implements from, 31, 45.
- Hoernes, Prof., on the chronology of the Este and Hallstatt Periods, 158, 159.
- Hollar, Wenceslaus, engravings by, of ground plans of destroyed City churches, 6.
- Hopkinson, H. L., on properties belonging to the Merchant Taylors' Company, 2, 3, 6, 7.
- Hugo, Rev. Thomas, account of Austin Friars, London, 10.
- Human remains: Hallstatt (Austria), 161; Hal-Tarxien (Malta), 135-7; La Cotte de St. Brelade (Jersey), 79, 82, 83; Ramridge End, Luton (Beds.), 67, 68.
- Hungerford, Sir Walter, chamberlain to Queen Philippa of Denmark, livery of, 170, 176, 177; payment to, 172, 185, 186.

I

- Ickleford (Herts.), flint implements from, 31, 32.
- Implements: *see* Flint, Neolithic, Palaeolithic, Stone.
- Ingham, Sir Oliver, London mansion of, 3, 4; tomb and effigy of, 3.
- Ingham (Norfolk), tomb and effigy of Sir Oliver Ingham, 3.
- Ingot, iron, Hallstatt (Austria), 153.
- Innocent III, pope, bull of, 12.
- Inscriptions: on doorway of the old Westminster Prison, 17, 18; on leaden pipe of conduit-head, Queen Street, London, 23.

Iron objects: adze or axe, Hallstatt (Austria), 149, 150; celts, Hallstatt, 149, 150; daggers, Hallstatt, 146-8; girdle-hooks, portions of, Hallstatt, 153; ingot, Hallstatt, 153; knife, crescent-shaped, Hallstatt, 150; palstaves, Hallstatt, 150; spear-head, Hallstatt, 149, 150; swords, Hallstatt, 147, 148.

Iver (Bucks.), flint implement from, 36.

Ivory pommel of sword, Hallstatt (Austria), 148-50.

Ivry, near Paris, flint implements from, 47.

J

James, Rev. E. O., excavation work in Jersey, 75.

Jars: Bronze Age, from Hal-Tarxien (Malta), 137, 139, 140; neolithic, Hal-Tarxien, 144.

Jenkinson, Mrs., excavation work in Jersey, 75.

Jersey: *see* La Cotte de St. Brelade.

Jervaulx (Yorks.), monastic arrangements at, 192, 197, 198.

Jerusalem, king of, 123, 124, 126.

John II, king of France, visit to London, 119, 125; death of, 126.

Jones, Inigo, hall designed by, 7.

Jones, Richard, the late, collection of flint implements, 37.

K

Keith, Dr. A., 75, 82 *n.*; on human skull found at La Cotte de St. Brelade (Jersey), 83.

Kemp, R., account of Aldgate Ward, London, 12.

Kensworth (Beds.), palaeolithic implements found at, 49.

Kent: *see* Canterbury, Copton-in-Preston, Crayford, North Cray, Northfleet, Swanscombe.

Kingsford, C. L.: The Feast of the Five Kings, 119-26; on the Grey Friars of London, 18.

Kitchen-middens, Danish, 27.

Kittredge, T. B., excavation work in Jersey, 75.

Klein-Glein (Styria), bronze bucket from, 161; bronzes with wheel-designs, 161.

Klein-Zöllnig (Silesia), bronze bucket from, 161.

Knives: flint, from Hal-Tarxien (Malta), 133, 143; iron, crescent-shaped, Hallstatt (Austria), 150.

L

La Bouffia Bonneval (La Chapelle-aux-Saints), flint implements from, 107, 108.

La Cotte de St. Brelade (Jersey), The site, fauna, and industry of, 75-118; animal remains, 78, 83-6, 113, 114, 116-18; bones, 78, 80, 82-8, 104, 106, 111, 114, 116-18; broken implements, 100, 105; cave, excavation of, 76 *ff.*; chronological inferences, 118; classification of implements, 89 *ff.*;

cores, 106, 107; *coups de poing*, 95, 97, 117; discoidal pieces, 98, 103, 107, 108; dwarf implements, 98, 104, 105; fauna, 85; flakes and flake implements, 89-107, 114, 115-17; flint implements, 77-80, 85-118; hammer-stones, 80, 109; hearth, remains of, 77, 80, 113; human deposit, 78-80, 86, 106, 112; human remains, 79, 82, 83; implementiferous bed, 77 *ff.*; — synthetic section, 113; industry in flint and other stone, 88-111; patina, 117; pebbles, 106-11; 'points', 80, 93, 94, 96, 107, 108, 116, 118; pounders, 109, 113; scrapers, 100, 101, 107, 109-11; skull, human, 83; stone implements, 89, 109-11; stratigraphy, 85, 100, 105, 111-18; 'tortoise' core, 92, 96, 107, 108.

La Cotte de St. Ouen (Jersey), Mousterian industry of, 95 *n.*

La Madeleine, culture of, 27.

Lancashire: *see* Furness.

Lankester, Sir Ray, collection of flint implements, 31.

La Quina (Charente), Mousterian bone implements from, 88.

Lea (Beds.), valley of the, 62, 63, 66; section between Caddington and Round Green, 64.

Leake, John, survey by, showing ground plans of destroyed City churches, 6.

'Lecto, Rex de', 123, 124, 126.

Lee, W. C., plan of the site and surroundings of Westminster belfry, 16.

Lee-on-Solent (Hants), flint implements from, 47.

Le Moustier (Dordogne, France): site and industry, 75-118; type of implements, 28-34, 37-9, 42, 44, 45, 77-80, 85-118.

Les Monts Grantez (Jersey), dolmen at, 110 *n.*

Lethaby, W. R., 120; on the belfry of Westminster Abbey, 14, 15.

Levallois-Perret, near Paris, flint implement from, 31.

Leverstock Green (Herts.), palaeolithic implements from, 52.

Lewes Priory (Sussex), monastic arrangements at, 197, 202.

Liège (Belgium), flint implements from, 30, 31.

Lingwood, E. T., flint implement found by, 43.

Lisle, Dame Anne, payments to, for services to Queen Philippa of Denmark, 172, 186.

LONDON:

Aldgate Crypt: *see below under* Medieval remains.

Austin Friars, convent of, 7; old houses recently destroyed in, 9, 10. *See also below under* Medieval remains.

Basing Lane, 6.

Bell Tavern and Bell Yard, Cornhill, 12, 13.

London (*continued*):

Bishopsgate Street, 4.
 Blackfriars: *see below under* Medieval remains.
 'Bradestreet' (Threadneedle Street), 3.
 Broad Street, 3.
 Brunswick Court (now Queen Square Place), 19.
 Chapel Street, conduit-head in, 18, 19.
 Christ's Hospital, water-system of, 19, 23, 25.
 Church Lane, 122.
 'Coldharbour', mansion of, 122.
 Corbet Court, Cornhill, 12.
 Cornhill, 3, 4, 12, 13.
 Fenchurch Street, 10; old houses destroyed in, 11.
 Forster Lane, 7.
 Gerard's Hall, Basing Lane, 12.
 Gracechurch Street: *see below under* Medieval remains.
 Great Fire, 2, 4, 6, 14.
 Kennington, 4.
 Leadenhall Street, 4, 10; old houses destroyed in, 11.
 Medieval remains in London, Recent Discoveries of, 1-26.
 Aldgate Crypt, sometimes called the Chapel of St. Michael, 10-12.
 Aldgate Pump, 12.
 Blackfriars, remains of Dominican priory at, 13-14; dorter, 14; guest-house and hall, 14; priory church and precinct, 14; sketch-plan of building and adjoining streets, 13, 14; tile pavement, 14; walls, 14.
 Conduit-head, Queen Square, demolition of, 18-26; apertures, 23, 24, 26; arches, stone, 21; barrel vault, 21, 24, 26; brickwork, 24-6; chambers, brick, 24-6; channels, brick and stone, 23, 26; chimney, 21, 22; conduit merged in garden of a Georgian house, 19-21; 'Devil's Conduit', 21; drains, 23, 25; foundations, 22; history of the original water-system, 18 ff.; inscription, 23; material of, 24; passage leading to, 19-22, 24, 26; paving tiles, 22; pipes, lead, 22-4; plan showing position of conduit chamber, 18; platform, 21; reservoir, 19-26; site in Rocque's map, 19; steps to reservoir, 21, 24; tank, 22-6; trap-door leading to conduit-head, 20, 21; vaulting, 21, 22, 24, 26; ventilating-shaft, 20, 22; walls, 22-5; wells and springs in the neighbourhood, 23-6; window, 22.
 Dutch Church, Austin Friars, 7-10; aisles, 7; arches, 7-9; bays, 9; buttresses, 7, 8; conventual buildings, 9; destruction by fire, and restoration, 7; doorway, 9; excavations, 7-10; foundations, 7, 8; masonry, 7; nave of the convent church of Austin Friars granted to the

London (*continued*):

Dutch nation in London, 7; objects found in excavation, 9; plan and south elevation, 8; porch, 9; walls, 7, 9; windows and window tracery, 7, 9.
 Gracechurch Street, vaulted chamber west of, 12, 13.
 Merchant Taylors' Hall, Threadneedle Street, 1-7; arches, 1, 2, 8; archway, 4; bachelors' chamber, 5; buttery, 6; buttresses, 1; chapel, 4-6; chapel chamber, 6; clearstory windows, 2; court-room, 5, 6; court-yard, 5; crypt, 2, 5, 6; fireplace, 4; floor, 1; foundations, 1, 8; garden, 5; king's chamber, 5, 6; kitchen, 2, 4, 6; kitchen roof, 4; oriel window, 2, 5; pantry, 6; recess, 2; Roman remains, 1; site, 1-7; walls, 1, 4, 5; windows, 1, 2, 5. *See also* Merchant Taylors' Company.
 Westminster belfry, 14-18.
 Merchant Taylors' Hall: *see above under* Medieval remains.
 New Palace Yard, Westminster, clock tower at, 15.
 Quakers' Tavern, Thieving Lane, 15.
 Queen Square, Conduit-head of: *see above under* Medieval remains.
 Red Lion Inn, 6.
 Royal Exchange: painting of the Feast of the Five Kings, 119.
 St. Benet Fink, 3, 5.
 St. Edmund, medieval parish church of, 7.
 St. Katherine and St. Michael, 12.
 St. Katherine Cree, 12.
 St. Leonard's, Foster Lane, traces of foundations of, 14.
 St. Martin in the Vintry, 122.
 St. Martin Outwich, 3, 5.
 St. Martin's-le-Grand, recent excavations on site of, 14.
 St. Michael's, Aldgate, 10, 11.
 St. Michael's, Cornhill, 12, 13.
 St. Paul's Cathedral, 4; the bell 'Great Tom', 15 n.
 St. Peter's, Cornhill, 3.
 Savoy Palace, 126.
 Smithfield, tournament in, 125.
 Sun Court, Cornhill, 6.
 'Taillourshalle', 3, 5.
 Thames Street, 122.
 Threadneedle Street, 1-7.
 Three Cranes Lane, 122.
 Vintners' Hall, 122.
 Vintry, 122.
 Water Lane, Blackfriars, 13.

London (*continued*):

- Weigh House Yard, 6.
 Westminster Abbey: Chamberlain's roll, 121;
 chronicles, 120, 121, 124; *Liber Niger*, 120, 121;
 monastic arrangements at, 196, 197, 203.
 Westminster belfry: *see above under* Medieval
 remains.
 Westminster Guildhall, 17.
 Westminster Sessions House, 16, 17; doorway
 with inscription, 17, 18.
 White Conduit, the, 18, 23.
See also British Museum.
 London County Council, 24, 26.
 Loveney, William, treasurer of Queen Philippa of
 Denmark, documents of, relating to the queen's
 marriage, 168, 172, 185-7; livery of, 170, 177.
 Lubbock, Sir John: *see* Avebury, Baron.
 Lubbock, Dr. Montagu, 145.
 Lyell, Angus, flint implements found by, 42 *n*.

M

- Maitland, William, on Westminster belfry, 15.
 Malmesbury, monk of, chronicle by, 123, 124.
 Malta: *see* Hal-Saflieni, Hal-Tarxien.
 Maltese sanctuaries, 128, 130. *See also under* Hal-
 Tarxien.
 Mann, Ernest A., on a conduit-head in Chapel
 Street, London, 19.
 Marett, R. R.: the Site, Fauna, and Industry of La
 Cotte de St. Brelade, Jersey, 75-118.
 Margam Abbey (Glamorgan), monastic arrangements
 at, 197.
 Markyate Street (Herts.), palaeolithic implement
 from, 53.
 Martin, Dr. H., excavations at La Quina, 88.
 Mason, C. S., 26.
 Medieval remains: *see under* London.
 Megalithic temple, Hal-Tarxien (Malta), 127-44.
 Mercers' Company hall, London, 7.
 Merchant Taylors' Company (Guild or Fraternity of
 St. John the Baptist of London), 1-7; chapel
 appropriated to use of the Guild, 4, 5; deeds of,
 2-6; 'Memorial or Ledger Booke', 3; minute-
 books of the Court of Assistants, 6; properties,
 2, 3, 6; 'Treasury Account', 6.
 Middlesex: *see* Acton, Syon, West Drayton,
 Yiewsley.
 Mixies Hill, Luton (Beds.), animal remains and
 palaeolithic implements at, 67.
 Monaco Congress, 158, 159, 161.
 Monceau-Laurent (Côte-d'Or, France), bronze bucket
 from barrow, 160, 161.

Montelius, Prof., on the chronology and antiquities
 of the Bronze Age, 158-61.

Montières-les-Amiens (France), Mousterian imple-
 ments from, 30, 33, 44, 88, 96, 97.

Monuments: neolithic temple, Malta, 127-44; tomb
 and effigy of Sir Oliver Ingham, Ingham church
 (Norfolk), 3.

Mousterian site and industry: *see* La Cotte de St.
 Brelade.

N

Nail-pick, with spiral stem, Hallstatt (Austria), 154.

Nails, bronze, Hallstatt (Austria), 156.

Nash, Edward, 7.

Neath Abbey (Glamorgan), monastic arrangements
 at, 197.

Necklaces, various, Hal-Tarxien (Malta), 137.

Neolithic: amphorae, Hal-Tarxien (Malta), 144; bone
 borers and burnishers, Hal-Tarxien, 143; bowls,
 Hal-Tarxien, 144; celts, *see below*; implements,
 Round Green, Luton (Beds.), 64; jar, Hal-Tarxien,
 144; pottery, Hal-Tarxien, 133, 143, 144; temple,
 Hal-Tarxien, 127-44 (*see* Hal-Tarxien); village,
 Hal-Saflieni (Malta), 127, 142, 143.

Neolithic Celt, Origin of the, 27-48; flake implements,
 40, 41, 44; hand-axes, 27, 31-4, 36, 41; ovate
 implements, 32, 33; patination, 46, 47; 'points',
 30, 31, 33, 39, 41, 42; polished celts, 28, 45; pre-
 historic flint-workers, 28; side-scrapers, 29-32,
 41, 44; transition forms, 27. Periods: Aurignac,
 28, 33, 42 *n*, 44; Cave, 27, 28, 32-4, 45, 48; Drift,
 32, 34, 41, 42, 46, 47; Le Moustier, 28-34, 37-9,
 42, 44, 45; St. Acheul, 29, 34, 46, 47. Specimens
 from: Cissbury (Sussex), 28, 43, 45-8; Copton-
 in-Preston, Faversham (Kent), 36, 37; Dunbridge
 (Hants), 36, 37; Grime's Graves (Norfolk), 28,
 29, 35-47; Hitchin (Herts.), 31, 45; Ickleford
 (Herts.), 31, 32; Le Moustier (Dordogne, France),
 30, 31, 33, 34, 37, 38; North Cray (Kent), 42, 43;
 Santon (Norfolk), 41; Southampton (Hants), 47,
 48; Taplow (Bucks.), 37, 38, 39, 45; Thames at
 Tilbury (Essex), 34, 36; Weeting (Norfolk), 40, 43;
 Yiewsley, near West Drayton (Middx.), 36, 37.

Netley Abbey (Hants), monastic arrangements at,
 192.

Norden, John, on Westminster belfry, 15.

Norfolk: *see* Castle Acre, Grime's Graves, Ingham,
 Santon, Thetford, Weeting, West Tofts.

Norman, Philip: Recent Discoveries of Medieval
 Remains in London, 1-26.

North Cray (Kent), celt-like implement from, 42,
 43, 44.

Northfleet (Kent), flint implements from, 44, 96, 97,
 108.

O

Oxford: Pitt-Rivers Museum, collection of palaeolithic implements, 103.

Oxfordshire: *see* Broughton.

P

Painting: Feast of the Five Kings, 119.

Palaeolithic Age: man, 66, 67; pond, Round Green, Luton (Beds.), 64-6, 68.

Palaeolithic floor near Caddington (Beds. and Herts.), 49-74. *See also under* Gaddesden Row and Round Green.

Palaeolithic implements: Bedmond, Abbots Langley (Herts.), 50; Caddington (Beds. and Herts.), 55, 57; Gaddesden Row (Herts.), 52-62; Gade (Herts.), valley of the, 50; Kensworth (Beds.), 49; Leverstock Green (Herts.), 52; Markyate Street (Herts.), 53; Mixies Hill, Luton (Beds.), 67; Ramridge End, Luton (Beds.), 67, 68; Round Green, Luton (Beds.), 57, 65, 67, 68-74; Warren Hill (Suffolk), 47.

Palstaves, iron, Hallstatt (Austria), 150.

Parker, J. H., on the conduit-head, Queen Square, London, 20.

Peake, Dr. E. A., excavations by, 28.

Pendants: bronze, Hallstatt (Austria), 150, 151; stone, Hal-Tarxien (Malta), 137, 143.

Peraunt, John, serjeant of arms, payment to, for services to Queen Philippa of Denmark, 172.

Peter de Lusignan, king of Cyprus, banquet in London to, 119, 120, 122-6.

Philippa, Princess (daughter of Henry IV), wife of Eric, king of Denmark, Norway, and Sweden, wardrobe accounts of the trousseaux of, 163-88; arms, royal, embroidered and engraved, 167, 172, 173, 185, 187, 188; arras, 167, 185, 186; 'attaby', 165, 175, 184; beaver, 165, 175; beds and bed-hangings, 166, 167, 170, 172, 181, 182, 185; blankets, 183; boots, 165, 166, 176, 182, 185; buckram, 166, 167, 180-3; caps, 165, 175; carriage (*currus et wherl*), 167, 168, 181, 182; chaplets, silk, 165, 181; clerks, liveries of, 170, 177; cloth, 165-7, 169-71, 176-83; cloth of Cyprus, 164-7, 169-71, 174, 176, 178, 181-4; 'cloth of estate', 167, 183; coffers, 169, 182, 184; coverlets, 166, 181, 182; 'covertour', 167, 185; curtains, 166, 167, 169, 180, 182; cushions, 166, 167, 182, 184, 185; Danish officials and retinue, liveries of, 171, 180, 183; dorsers, 169, 180; dresses, 164, 165, 174, 175; embroidery, 164-7, 171-4, 185, 186; ermine, 164, 165, 174, 175, 179, 184; foot-gear, 165, 166, 176, 182, 185; furs,

164-6, 174-6, 178; fustians, 166, 167, 170, 180, 182-4; gold embroidery, 164, 167, 169, 174, 175; gowns, 164, 174, 175; head-gear, 165, 175; hoods, 165, 170, 175, 177, 178, 179; knights, liveries of, 170, 171, 177; laces, 167, 181; ladies-in-waiting, liveries of, 170, 176; leather, 165-7, 176; liveries, 170, 171, 173, 176 ff.; mantles, 164-6, 174, 175, 178; mattresses, 166, 184; minever, 164-6, 170, 174-6, 178-9, 183, 184; minstrels, livery of, 170, 177; miscellaneous articles, 167-9, 182-5; pearls, 164, 165, 174; portmanteaux, 169, 182; 'punceons' or 'pinsons', 166, 176, 182, 185; queen's chapel, silver plate and ornaments for, 168, 169, 188; queen's garments, 164-7, 174 ff.; queen's ship, hangings for, 170, 180, 181, 186; 'racamatus', 169, 182-4; retinue, liveries of, 170, 171, 176 ff.; ribbon, 167, 181; saddles, with gilt harness and bits, 167, 168, 183; satin, 164, 167, 174, 184, 185; sheets, 166, 180, 181; shoes, 166, 176; silk, 165-7, 180-3; silver plate, 168, 169, 187, 188; sleeves, 164, 165, 175; spangs, silver-gilt, 165, 181, 185; stock, 165; supertunics, 164, 165, 174; tapestry, 166, 167, 185; 'tapets', 166, 167, 182, 184, 185; tartarin, 165, 166, 169, 175, 180, 182, 185; tester, 166, 167, 185; trains, 165, 174; travelling dress, 165, 174; traverses, 169, 182; tunics, 164, 165, 174, 175; velvet, 164, 165, 174, 184; wages relating to the marriage, 172, 185-7; wedding dress, 164, 174; 'westvall', 167, 181, 183, 184; worsted, 170, 181-3.

Philippa, queen of Edward III, 124, 125.

Picard, Arnald, 121.

Picard, Henry, vintner and mayor of London, banquet to Edward III and foreign kings by, 119-26; will of, 122.

Picard, John, 'barbor', 121.

Picard, Joyce le, 121.

Picard, Margaret, 119, 122.

Picard, Peter le, 121.

Picard, Richard, sheriff of London (1260-1), 121.

Pigs, figures of, Hal-Tarxien (Malta), 132, 134, 142.

Pins, bronze, Hallstatt (Austria), 154-6, 160.

Pits: Butterfield's, Gaddesden Row (Herts.), 49, 50, 51; Cissbury (Sussex), 28; Grime's Graves (Norfolk), 28, 39, 40, 42; Mixies Hill, Luton (Beds.), 67; North Cray (Kent), 42, 43; Ram ridge End, Luton (Beds.), 67; Round Green Luton (Beds.), 64, 65, 67.

Pitt-Rivers, General, the late, excavation of Cissbury flint-mines, 46.

Plaques, silver, Hal-Tarxien (Malta), 141.

Plates, bronze, Hallstatt (Austria), 150, 156, 157.

- Pleistocene Age, species of the, found at La Cotte de St. Brelade, Jersey, 85.
- Pommel of sword, ivory, Hallstatt (Austria), 148-50.
- Pottery: Bronze Age, Hal-Tarxien (Malta), 135, 137, 139; Early Iron Age, Hallstatt (Austria), 157, 160; neolithic, Hal-Tarxien, 133, 143, 144; Punic, Hal-Tarxien, 134; Roman, Gaddesden Row (Herts.), 52; Round Green, Luton (Beds.), 64.
- Prehistoric Society of East Anglia, excavations for, 28, 37 *n.*
- Pulteney, Sir John de, will of, 122.
- Punic potsherds, Hal-Tarxien (Malta), 134.
- Q
- Quirke, Mr., on the conduit-head, Queen Square, London, 24.
- R
- Ramridge End, Luton (Beds.): human remains, 67, 68; palaeolithic implements, 67, 68.
- Ramsauer, Georg, exploration of the Early Iron Age cemetery at Hallstatt (Austria) by, 145; unpublished journal of excavations, 158, 162.
- Read, Sir C. Hercules, 75; on a collection of antiquities from the Early Iron Age cemetery of Hallstatt (Austria), 145-58.
- Reader, Francis W., 1, 26.
- Reading, John de, monk of Westminster, chronicle of, 120, 124.
- Reilly, Charles, plan of the Dutch Church, Austin Friars, London, 7, 8.
- Reinecke, on the chronology of the Hallstatt Period, 159.
- Rhodes, earthquake at (1364), 123.
- Rice, Garraway, collection of flint implements, 36.
- Richard of York (c. 1405), livery of, 177; payment to, for services to Queen Philippa of Denmark, 172, 185.
- Rickmansworth (Herts), flint implements from, 47.
- Riley, W. E., 26.
- Rings: amber, Hallstatt (Austria), 157; bronze, Hallstatt, 154, 156, 158, 160.
- Robinson, Dr. Armitage, 120, 121.
- Roman remains: Gaddesden Row (Herts.), 52; Gracechurch Street, London, 12; Round Green, Luton (Beds.), 64; Threadneedle Street, London, 1.
- Round Green, Luton (Beds.), palaeolithic floor at, 62-74; animal remains, 67; brick-earth, 62, 64, 66; brickyard, 62, 64-7; conjoined flakes, 70; contorted drift, 65, 66, 68, 69; flint implements,

- 64; geology, 62-6; map of district, 63; neolithic implements, 64; palaeolithic implements, 57, 65-74; pit, 64, 65, 67; pond of the Palaeolithic Age, 64-6, 68; Roman remains, 64.
- Row, Prescott, flint implements found by, 47.
- Royal Society, grant by, for excavation work at La Cotte de St. Brelade, Jersey, 79.

S

- Sacken, E. von, on antiquities from Hallstatt (Austria), 146, 148, 150-2, 154, 156, 157, 160.
- Sadler, Fred., collection of flint implements, 31.
- St. Acheul, Amiens (France), flint implements from, 47.
- St. Acheul type of implements, 29, 34, 46, 47, 96, 97.
- St. Agatha's Abbey (Yorks.), monastic arrangements at, 198.
- St. Walburge, Liège (Belgium), flint implements from, 34.
- Santon (Norfolk), flint implement from, 41.
- Santon Downham (Suffolk), flint implements from, 37.
- Schmidt, R. R., on Le Mousterian type of implements, 31, 42.
- Scotland, king of: *see* David II.
- Scrapers, La Cotte de St. Brelade (Jersey), 100, 101, 107, 109-11.
- Scrope of Masham, Henry, Lord, livery of, 177; payment to, for services to Queen Philippa of Denmark, 172, 185.
- Sculpture: clay jars, Hal-Tarxien (Malta), 137; fragments of megalithic buildings carved in Maltese building stones, Hal-Tarxien, 142; leg-bones of birds, Hal-Tarxien, 137; ornamented troughs, Hal-Tarxien, 133; slab, with symbolical objects, Hal-Tarxien, 142; statue and statuettes, Hal-Tarxien, 133, 138, 142.
- Shuttleworth, C. B., 204.
- Silver plaques, Hal-Tarxien (Malta), 141.
- Simon of Sudbury, bishop of London, grant by, 4.
- Slupce, near Kalisz (Poland), bronze bucket from, 161.
- Smith, Reginald A., 75, 88 *n.*, 90 *n.*, 92 *n.*; Notes and chronology of a collection of antiquities from the Early Iron Age cemetery of Hallstatt (Austria), 158-66; Origin of the Neolithic Celt, 27-48.
- Smith, Worthington G.: Notes on the Palaeolithic Floor near Caddington (Herts. and Beds.), 49-74.
- Société Jersiaise, excavation work by the, at La Cotte de St. Brelade, 75, 76, 77, 79; flint implements in museum of, 82 *n.*, 88.

Sollas, Prof. W. J., 77, 83 *n.*, 85 *n.*, 86 *n.*, 103 *n.*, 116 *n.*, 118 *n.*
 Somerset : *see* Cleeve.
 Somme valley, flint implements from the, 34, 44.
 Southampton (Hants), flint implement from, 47, 48.
 Spear-head, iron, Hallstatt (Austria), 149, 150.
 Spheres, bronze, formed of two basins, Hallstatt (Austria), 150.
 Spindle-whorl, grey ware, Hallstatt (Austria), 157.
 Stanley, Dean, on Westminster belfry, 16.
 Statues in neolithic temple, Hal-Tarxien (Malta), 133, 138, 142.
 Stodie, Sir John, vintner, 122.
 Stone Age : megalithic monument, Hal-Tarxien (Malta), 127-44.
 Stone implements : La Cotte de St. Brelade (Jersey), 89, 109-11. *See also* Flint, Neolithic, Palaeolithic, Scrapers.
 Stone objects : conical stones, Hal-Tarxien (Malta), 141, 142 ; whetstone of grey slaty stone, Hallstatt (Austria), 157. *See also* Sculpture.
 Stow, John, on a banquet to foreign kings in London (1363-4), 119, 120, 122, 126 ; on London antiquities, 7, 11, 12, 15, 19 ; on the introduction of side-saddles, 167.
 Struthers, R. de J. Fleming, excavation work in Jersey, 75, 86 *n.*
 Strype, John, on London antiquities, 15, 19.
 Studs, bronze, Hallstatt (Austria), 156.
 Stukeley, William, on Westminster belfry, 15.
 Suffolk : *see* Elvedon, High Lodge, Santon Downham, Warren Hill.
 Surrey : *see* Waverley, Weybridge.
 Sussex : *see* Cissbury, East Dean, Lewes.
 Swanscombe (Kent), flint implements from, 107.
 Swords : bronze, Hallstatt (Austria), 160 ; iron, of Bronze Age type, from Hallstatt (Austria), 147, 148.
 Syon (Middx.), foundation of the Brigittine House of, 164.

T

Tannheim (Leutkirch, Württemberg), bronze bucket from, 161.
 Taplow (Bucks.), flint implements from, 37, 38, 39.
 Tarxien (Malta) : *see* Hal-Tarxien.
 Taylor, Chevalier, painting of the Feast of the Five Kings by, 119.
 Taylors and Linen Armourers, Fraternity of, 3.
 Thetford (Norfolk), flint implements from, 37.
 Tilbury (Essex), flint implements from the Thames at, 34, 36.
 Toilet implements, Hallstatt (Austria), 154.

Tranchet, Danish, 27.
 Tube of flat wire, spiral, of bronze, Hallstatt (Austria), 156.
 Tweezers, pair of, Hallstatt (Austria), 154.
 Twining, Miss Louisa, 19.

U

Urns, cinerary, Bronze Age, from Hal-Tarxien (Malta), 135-9.

V

Valletta Museum (Malta), exhibition of objects discovered at Hal-Tarxien, 144.
 Vanneck, family of, 9.
 Vansittart, Capt. Arnold B., celt-like implement found by, 43.
 Vases : Bronze Age, from Hal-Tarxien (Malta), 136, 139, 140 ; bronze circular cover, Hallstatt (Austria), 151, 156.
 Ver (Herts.), valley of the, 49 ; palaeolithic implements from, 53 ; section of, 50, 51.
 Vertue, George, 7.
 Vessels, Bronze Age, from Hal-Tarxien (Malta), 133, 136, 139, 140.
 Vienna Museum, exploration of the Early Iron Age cemetery at Hallstatt (Austria) on behalf of, 145.
 Villanova Period, types of the, 158, 162.
 Vintners' Company, 119, 122.
 Votive offerings, 151.

W

Walcott, Rev. Mackenzie, on Westminster belfry, 16.
 Waldemar IV, king of Denmark, banquet in London to, 119, 120, 126.
 Wardrobe accounts of the trousseaux of Princess Philippa, wife of Eric, king of Denmark, Norway, and Sweden, 163-88.
 Warren Hill (Suffolk), palaeoliths from, 46.
 Waterton, Lady Katherine de, payment to, for services to Queen Philippa of Denmark, 172, 186.
 Watsch (Carniola), bronze bucket from, 161.
 Waverley Abbey (Surrey), monastic arrangements at, 197.
 Waydot, son of King Keinstut of Lithuania, 124, 126.
 Weeting (Norfolk), flint implements from, 40, 43.
See also Grime's Graves.
 Wells, W. C., collection of flint implements, 37.
 Wemme, Thomas Molyngton, baron of, payment to, for services to Queen Philippa of Denmark, 172, 186.
 West Drayton (Middx.), flint implements from, 37.
 West Tofts (Norfolk), flint implements from, 37.

- Weybridge (Surrey), bronze bucket from, with movable handles, 161.
- Wheel-design in ornamentation, 161.
- Whetstone of grey slaty stone, Hallstatt (Austria), 157.
- Willis, Prof., on prebend's house, of Georgian period, at Worcester, 199, 200.
- Wilson, Canon J. M., excavations in garden of, on site of Worcester Priory (Worc.), 194, 204.
- Wiltshire: *see* Fisherton.
- Woodward, Dr. A. Smith, 75, 88.
- Woolley, Ernest, 1 *n.*, 7.
- Worcester Priory (Worc.), 189-204; bowling alley, 196; buttery, 196; cellarge, 196; chapel, 198, 203, 204; chapter-house, 189; church, 189; cloisters, 189, 190; common house, 196; convent kitchen, 198; frater, 189; garden, 196; gardrobe, 191; general plan of the priory, 189; inventory of music and chapel stuff, 203, 204; Lady chapel, 203, 204; library, 191; monastic prison, 201; parlour, 189; prebendal houses, building and destruction of, 194, 198, 199; presbytery, 194; refounding of the cathedral, 198; St. Wulstan's crypt, 194; site, 189; song school, 203, 204; sub-prior's lodging, 196; suppression at the Reformation, 193, 199; treasury, 191, 196.
- The Dorter Range, 189-204; aisles, 197; alleys, 190, 193, 194, 199; arches, 190, 201, 204, 206; barbery, 198; barrel vault, 200, 201; bays, 190, 192-6, 200, 201; buttresses, 195, 200; chambers, 193, 196, 199, 201-3; cubicles, 191, 192; dark alley, 193, 194, 199; dark room, 197, 201; doorways, 190-5, 200, 201, 203; drains and drain-pit, 197, 202; entrances, 190-3, 201; fireplace, 195; floors, 190, 193, 195, 200; infirmary, 189, 191, 194-202; infirmary chapel and kitchen, 198; infirmary's lodging, 198; lead, 193; measurements, 189, 193; pilasters, 190, 194, 195, 200; pillars, 191; recesses, 195, 200; remains, 189, 190, 194, 195, 200-2; reredorter, 189, 196-203; roofs, 189, 191, 193; shields, blank, 192; site, 189, 194, 197; staircase, 194, 195, 203; steps, 190, 191, 193, 194; subvaults, 189-91, 193-8, 200-3; vices, 191, 203; walls, 189-97, 200-2; windows, 193, 195, 201, 202.
- Worcestershire: *see* Worcester Priory.
- Wulstan, bishop of Worcester, monastic buildings erected by, 189, 192.
- Wylie, J. H., 163 *n.*, 169 *n.*, 173.
- Wyngaarde, Van den, view of London and Westminster, 15.
- Y
- Yakeslee, John de, 3, 6.
- Yiewsley, near West Drayton (Middx.), flint implement from, 36, 37.
- Yorkshire: *see* Fountains, Jervaulx.
- Z
- Zammit, Professor T.: The Hal-Tarxien Neolithic Temple, Malta, 127-44.



